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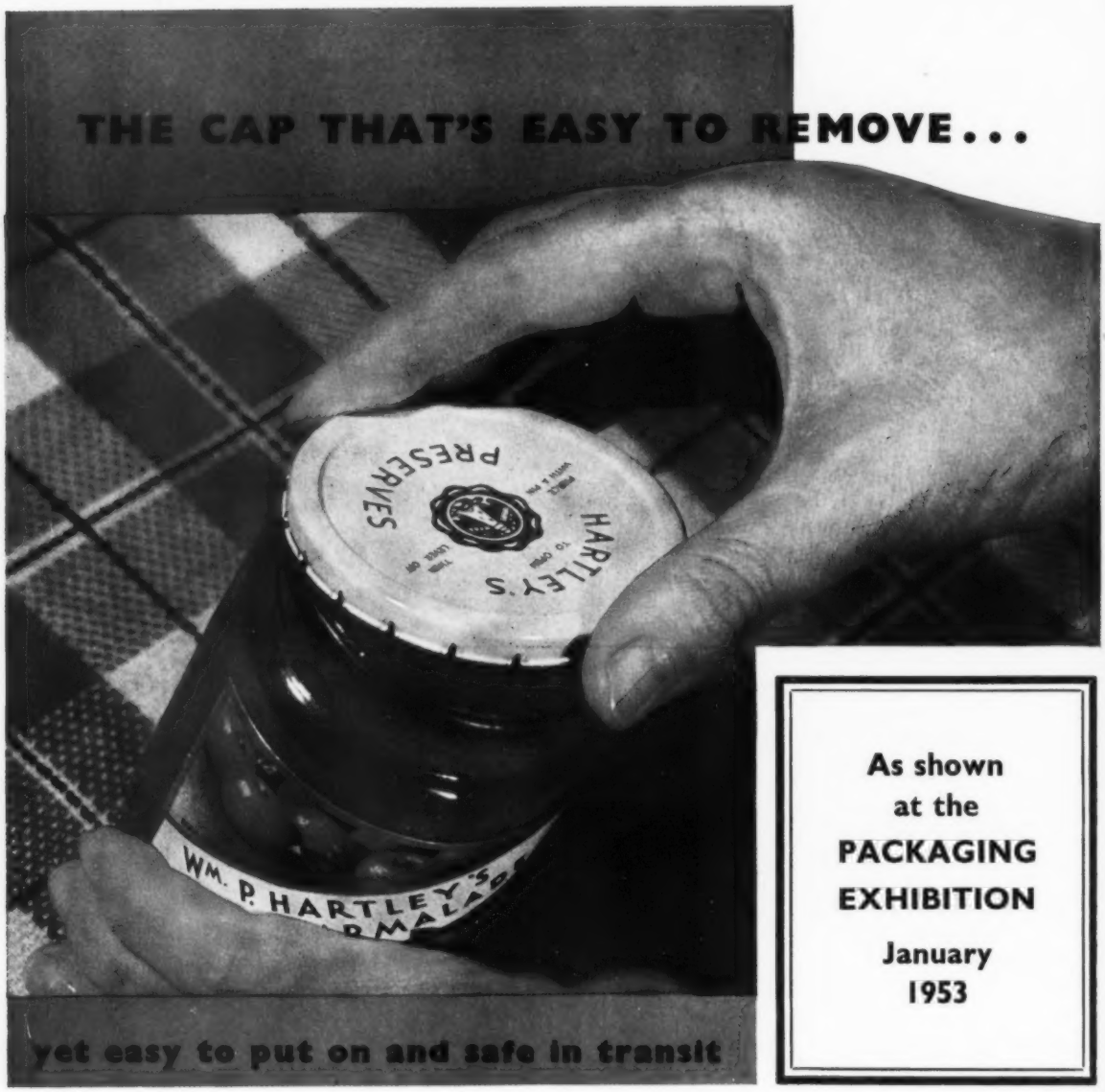

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FOOD MANUFACTURE

CONTENTS

	Page
Editorial	127
Beef Production in Australia. *A. L. Kidson*	131
The Bacteriological Examination of Canned Ham. Part II. *R. Buttiaux*	135
Modern Bakery	138
Fruit and Vegetable Storage in America	140
Correspondence	143
The Vitamins. Part I. *F. A. Robinson, M.Sc.Tech., LL.B., F.R.I.C.*	144
Shell-fish for Human Consumption. Part II. *Elliot B. Dewberry, M.B.E., F.R.San.I., F.R.I.P.H. & H.*	149
Transport and the Food Industry. Part III. *Graham Saville*	152
The Viscosity of Sugar Solutions	153
Trade News	154
Information and Advice	166
Recent Patents and Patent Specifications	167
Trade Marks and New Companies	168

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FOOD MANUFACTURE

Vol. XXVIII, No. 4 April 1, 1953

The Food Group Comes of Age

THE generous tribute paid by Dr. L. H. Lampitt to Mr. Leonard Hill when proposing the toast of the Food Group on the occasion of its twenty-first birthday celebrations held at the Dorchester Hotel on March 7 took some of his hearers back in memory to 1931. At that time no organisation existed for food chemists and technologists, and they had no place where they could meet.

It was the result of what Dr. Lampitt described as Mr. Hill's vision that an announcement of the inauguration of the Society of Food Industry was made in the September, 1931 issue of FOOD MANUFACTURE setting out its objects. It is of interest to note that these have been implemented in their entirety by the Food Group during the past 21 years.

The publication of the announcement resulted in a flow of letters of approval, and measures were taken to prepare details of the constitution and regulations of the new Society, and to arrange the date for a first meeting.

Before this meeting took place, Mr. Hill and the editor of FOOD MANUFACTURE were invited to meet Dr. Lampitt, Prof. H. Raistrick, and Mr. H. Pooley, general secretary of the Society of Chemical Industry, who were concerned with the formation of a Food Group of the Society, and were anxious that there should be no undesirable duplication of organisations and suggested it would be best to join forces.

Mr. Hill unhesitatingly agreed, and in the August, 1932 issue of FOOD MANUFACTURE it was prominently announced that what he had had in mind—that the time had come for the food industry to have its own technical society—would best be met by the Food Group of the Society of Chemical Industry and that in fact it could not be in better hands.

It is pleasant to record that Mr. Hill's prescience as to the necessity for such an organisation and his faith in its success have been fully justified and that their recognition was so gracefully acknowledged at such a function as that of March 7.

Dr. Lampitt himself was chairman of the Food Group for the first five sessions, from 1932 to 1936, during the time when the Group was in its infancy, and passed on to his nine successors the tradition of organisation, energy, and judgment which characterises it. In the years following, the Group has never failed to receive his help and guidance.

World Food Supplies

THE prospects for feeding world population in the next 10 years are discussed in the Second World Food Survey prepared by FAO.

The present survey is the logical sequel to the original one published in 1946, itself inspired by recommendations made at the Hot Springs Conference of 1943. At the time of publication of the 1946 survey, world food supply reached its lowest ebb, and although there has been a gradual recovery in some parts of the world, in many others food production still remains below pre-war levels, and the proportion of the world's population suffering from inadequate food supplies has grown appreciably larger.

In the latest survey, the food situation has been considered against certain definite targets, worked out on a basis which allows for human requirements under different conditions in various parts of the world. These targets are seen as a goal to be reached in 1960; although it is admitted that they do not reach the ultimately desirable standards, those responsible for the survey have been concerned to aim at what is practicable under current world conditions, and to provide a yardstick against which actual progress can be judged.

One of the points which is most apparent is that it is not only the amount but also the quality of food which has to be considered in many areas. In parts of south-east Asia, for example, diets contain too little protein and vitamins, and rely too heavily on cereals. Each group of foodstuffs has been considered separately and the chances of reaching the targets frankly discussed.

That there are no grounds for complacency is emphasised by the fact that the largest increases in population are still in general taking place where food supplies are most seriously inadequate. It is precisely in these areas that post-war recovery has been least impressive when compared with the increases in food needed to meet the 1960 targets.

The final conclusions contained in the survey are

that the attainment of these targets depends in effect on the continued and accelerated developments upon present lines in the technical, educational, and administrative fields; absence of a world war or similar catastrophe; increasing liberalisation of international trade; and increased integration of national and international programmes at all levels.

Cornish Pilchards

THAT the alarm caused in the home pilchard canning industry by the importation of large quantities of cheaper South African canned pilchards had proved unfounded for the moment was reported by the Fishery Officer, Mr. C. H. B. Richards, to the Cornwall Sea Fisheries Committee at a recent meeting in Truro.

The position of the Cornish pilchard industry seemed brighter which, in Mr. Richards' opinion, was owing mainly to the better quality and flavour of the Cornish pilchard. However, it was necessary that the home industry should not rest on its laurels as it was not yet out of the wood. Further developments were taking place in the pilchard fisheries of South Africa, and far greater landings were contemplated in the near future. It was therefore natural to assume that still larger South African imports might be expected and that an intensive attack on the British market might be made.

The year 1952 had been marked by a good summer and autumn pilchard season. In Cornwall, 81,812 cwt. of pilchards, valued at £127,994, were landed, compared with 10,351 cwt., valued at £27,382. Plymouth landings of pilchards during 1952 were 7,661 cwt., worth £12,231, making a total for the pilchard fisheries of 89,473 cwt., valued at £140,225.

Canned Rice Problems

A RECENT paper from Bengal's College of Engineering and Technology (*Trans. Indian Inst. Chem. Engineers*, **4**, 116-123, 1952) deals with interesting problems encountered in rice canning. Ever increasing quantities of rice and rice products will probably be canned for the rice-eating countries, but the canning process is not as simple as for many other foods. To begin with, the flow of heat through the contents of the can is normally rapid and thorough, its transmission being almost wholly due to convection but, with the gelatinisation of the rice starch, conduction partly takes the place of convection, causing the temperature to rise less rapidly and with less uniformity.

A second sharp change in the reaction of canned rice to heat occurs when the liquid or cooking liquor, by then containing appreciable amounts of dissolved starch, sets into a gel. From this point, heat flows entirely by conduction, and the rate of temperature rise is negligible. It follows from this that the proper sterilising temperature must be reached before the second change in the contents of the can takes place. To ensure this, the size of rice grain must be carefully selected and the proper proportion of grain and water in the can must be established and controlled, for these are apparently the decisive influences which bring about both starch gelatinisation and the more serious gelling of the liquor. Varietal differences in rice, while affecting results in the case of ordinary cooking, do not appear to exert an appreciable influence when the rice is cooked under pressure.

Queensland's Sorghum

AFTER four years' operation, the Queensland-British Overseas Food Corporation has been wound up, the conclusion having been reached that, working under the natural conditions which prevail in the region where the scheme had been sited (the Queensland Central Plain), it is impossible to expect that crops of sorghum can be raised for a figure lower than the return which can be expected for them. Another determining factor has been the uncertain and undependable climate. Of the four crops of sorghum raised, the first was damaged by frost, the second by flood, and the last two by drought. For the last crop, reaped from some 60,000 acres, the average return was at the rate of a mere five bushels per acre.

It was originally envisaged that the scheme would ultimately include the annual cultivation of 250,000 to 300,000 acres of sorghum, which it was believed would turn off 320,000 pigs a year. This is far from what has been achieved in actual practice, the total net loss to the two Governments in the four years of operation being £A880,000.

That the operation has not been without value is borne out by the fact that it has shown that sorghum can be grown in the 20 in. rain belt in Queensland and that fatstock can be turned out from this land. Further, it has been decided to continue operations on a smaller scale under the sole responsibility of the Queensland Government, it being considered that a corporation responsible to two Governments is not a suitable organisation for carrying out experimental work of this type.

To quote from one of the Corporation's earlier reports, the scheme has shown a tendency to "proceed in a headlong manner"—a characteristic of the more extensive and far more costly operations in East Africa.

With our contemporary, *World Crops*, we feel inclined to ask: Is it too much to hope that at long last politicians and administrators may begin to learn that in schemes of agricultural development the watchword should always be *festina lente*?

New Use for Monosodium Glutamate

THE way to improve the flavour, colour, and texture, and to lengthen the storage life of frozen foods by the addition of monosodium glutamate has been described in a paper by Dr. Donald K. Tressler, scientific director, Quartermaster Food and Container Institute, Chicago, Karl B. Norton, and Lillian B. Farkas.

Samples taken included frozen shrimp, salmon steaks, mackerel, haddock, ground beef, cube steaks, fowls and turkeys, cut-up fowl, asparagus, peas, green beans, leaf and chopped spinach, broccoli, cauliflower, and brussels sprouts.

Samples were packed with and without the addition of monosodium glutamate, the amount used being equivalent to 1½ lb. per 1,000 lb. of frozen product.

After freezing, some of the foods were stored at 0°F.; others were stored at 10°F. At regular intervals up to 10 months, and in some case 14 months, samples were removed from storage for visual examination and for tasting by members of a trained taste panel.

The addition of monosodium glutamate to foods before freezing was found by the panel to result in the improvement of their flavour and acceptability, which became more evident as the storage period lengthened. The development of both stale flavour and rancidity was retarded.

As an example, untreated Pacific Silver salmon steaks had begun to lose their fresh red colour after only three months' storage at 0°F., whereas identical steaks dusted with glutamate before freezing had a good bright colour after 10 months and were still pink after one year of storage.

The controls were dry and flavourless after 10 months, whereas the glutamate-treated samples had a fair flavour after a year.

The same effects were noted in connexion with the other items mentioned.

The Price of Civilisation

THE bringing of peace and the benefits of medical science to primitive races is rightly considered to be the duty of their more civilised brothers. There are, however, many pitfalls to be avoided as is evidenced by the state of affairs in Southern Rhodesia.

Southern Rhodesia is on the way to starvation, warns Mr. P. Gordon Deedes, chairman of the Natural Resources Board, an independent body whose mission is to ensure a good future for the country, based on the wise and careful use of Nature's gifts. Had the country been left to the indigenous races of Southern Rhodesia, there would have been little need for such a thing as the Natural Resources Act. Disease and tribal warfare prevented too rapid an increase in population, and Nature kept a careful balance between the land and the number of people and animals that it supported.

Europeans, in bringing peace to the country, destroyed that balance. They improved the health of the native, thereby increasing his numbers, and taught him to use the plough, which by its misuse speeded soil erosion. In the native areas, food production in relation to ground under cultivation is lamentably low, and strenuous efforts to improve the position are being made.

Obviously no one would say for one moment that the native races should not be aided in every way towards a healthier and more prosperous life, and Mr. Deedes hits the right nail on the head when he says that the only way to overcome the present difficulties would be to concentrate on placing the agricultural industry on a sound footing. "Every thousand pounds," he says, "spent on a technical man in the field today will save the country thousands of pounds in the future and help to ensure adequate food resources. For every thousand pounds not spent today, millions will have to be spent reclaiming damage which should never have happened."

Winter Egg Production

IT has always been an accepted fact in the egg industry that in winter home-produced eggs would be in short supply; even before the present system of rationing was introduced by the Ministry of Food there was in effect, rationing by price. Some years ago, however, Ministerial policy appeared to indicate that they had decided to encourage producers to concentrate more on winter production at the expense of spring and summer output by offering a substantial increase per dozen for eggs marketed through the Packing Stations during the months November to January, and it is interesting to note how this policy has affected the intake figures of at least one station in the Central Scottish area.

During the years 1942-9 winter throughput averaged only some 20 per cent. of the eggs marketed during the flush season, but since the price policy began to take effect, there has been a remarkable levelling out in supply, figures for the present winter showing a maintenance in production of not less than 40 per cent. of the highest total of eggs marketed in March and April of 1952.

While the purely specialist poultry farmer has always attempted to produce as many winter eggs as possible, it would now seem that the general farmer, at least in the Central Scottish area, is paying more attention to the economics of egg production and is prepared to spend fairly large sums in changing over from the old type free range house to well-lit modern sheds capable of holding up to 1,000 birds

in cages, or converting existing accommodation on the farm to the deep litter system of poultry keeping.

Apart from egg production this policy has had the effect of allowing a more equitable distribution of table poultry throughout the year, and an increasing number of producers are now found who are willing to dispose of their birds from mid-January onwards when prices are higher than in the latter part of the year.

With the decontrol of prices, it now remains to be seen whether or not this trend in winter production will be maintained or even extended, but present indications are, that with the flush season in the countries able to export to Great Britain coinciding with our own, winter egg production will remain a very profitable venture.

The only section of the industry on whom the concentration on winter production may throw an increased burden is the hatchery, and already it would appear that the demand for day-old chicks hatched during March and April is exceeding the available supply.

Scottish Tomato Prospects

SCOTTISH tomato growers are facing a new season with only a limited prospect of successful operation; the fact that several large older houses have been offered privately is an indication that for some growers at least the coming season has not enough attraction to encourage their retention. Some of these offers are substantial but there is no evidence that buyers are anxious to take over. The prospect is that the owners will allow their properties to remain idle rather than face another year of loss. This applies mainly to houses which have been in commission for about 40 years and which have become a liability instead of an asset.

The problem is bound up with the high level of taxation which prevents any real retention of reserves against new construction, and with the low level of returns, which also limits available current maintenance and renewals.

The most urgent need now evident in Scotland is either a revision of taxation policy, which would require a national ruling; alternatively a revolutionary development which would permit the construction of houses at a fraction of present costs.

A recent survey by one company is of interest. Assuming that their houses fall due for renewal in 15 years, they face a cost of something like £85,000 for new houses, £12,000 for boiler, and £2,000 for ancillary plant.

Where can money of that order be found? It most certainly cannot be got from current earnings, since most companies and nurseries have been fortunate to clear their costs, or to make a little profit. The possibility of the erection of cheaper tomato houses has been mooted in Scotland by growers facing impossible replacement costs. One suggestion is that prefabricated arches might be used in co-ordination with clear plastic sheeting, which would give a better heat transmission than glass and be easily laid on. Such sheeting is now being produced in 72 inch widths which suggests that experiments might well be carried out to determine whether houses of this type would function efficiently and also at a lower cost than the more solid traditional glass, timber, and metal house. Several of the large growers are now studying such projects in an effort to achieve new type houses, and the results will be awaited with interest.

Chocolate Flavour

CHOCOLATE manufacturers, plant scientists, and Governments are working together with cacao growers to make the chocolate of tomorrow as piquant as the chocolate of 50 years ago. Because of the skill of manufacturers in adjusting their formulae, few consumers realise (state Dr. Robert L. Fowler and Mr. N. W. Kempf, *Foreign Agriculture*, **16,** 10, 184) that the flavour of chocolate has been changing gradually. This has been necessary because the high quality "flavour" varieties of cacao have gradually been giving way to less desirable varieties and because the old painstaking practices of harvesting and fermenting, which contributed so much to full-bodied flavour, have fallen into disuse in many areas.

The story of what has happened to the quality cacao in Ecuador is typical of what has happened to cacao throughout the western hemisphere. *Cacao arriba*, a product of Ecuador, was once of very high quality and had a rich spicy aroma which caused it to be much in demand by chocolate manufacturers for strengthening the flavour of their products. At the beginning of the present century, however, the quality of this variety began to decline. It was found, for example, that other kinds of bean were easier to grow, reached maximum production several years earlier, yielded larger harvests, could be propagated more easily, and, as supplies were short, commanded prices comparable with *cacao arriba*.

To compensate for this, manufacturers in the United States changed their recipes and by blending with other cacaos on the market still managed to turn out a high grade product.

Over the years, so extensive has been the shift to "non-flavour" cacaos (but not less nutritious ones) that chocolate now contains about 20 per cent. of flavour beans instead of the 70 per cent. it once contained.

Australian beef cattle at a water hole.

Beef Production in Australia

A. L. Kidson

It is often argued that the vast inland areas of central and northern Australia could become a second Argentina and supply Great Britain with unlimited quantities of beef. That region does indeed comprise a cattle-raising potential capable of huge expansion; but it will not contribute much beef to British larders in the near future for the reasons given in this article.

IN the 1950-51 season, Australian beef received into store in the U.K. totalled 49,316 tons, according to Australian Meat Board figures. The following year this intake dropped to 13,984 tons, and some authorities in Australia predict an even greater decrease in the season ahead.

Reports have suggested that meat shipments from Australia to the U.K. in 1953 will be substantially higher. Much of this meat will be mutton and lamb, produced in greater quantities by Australian graziers following the sharp drop in wool prices three years ago. If beef exports are, in fact, stepped up as a result of the recent price increase, the extra supplies certainly will not come from the inland northern areas, where the beef output in recent months has seriously slumped.

Combating Drought

The reason for this can be stated in one word—drought. That region averaged only 14 inches of rain in 1951, instead of the normal 24 inches. In consequence, the stock routes for bringing out cattle from the interior to the coastal slaughterhouses were closed; according to one estimate more than a million animals perished, and those which survived were not mustered. Of the 100,000 store beasts normally sent overland into Queensland each year for fattening and slaughter, not one was moved.

Beef producers know that a setback of this kind, the worst in 50 years, takes time to adjust—up to 10 years in some areas. Government measures have included the sinking of new water-bores in the drought-stricken regions, and along the stock routes. Piping, pumps, and other water supply equipment have been provided, but much more than this will be needed to solve the main problem of increasing the area's output of beef.

Some urge the introduction of Zebu-cross cattle, of the Santa Gertrudis, and other famous strains. These are tick-resistant, and so escape tick fever, which attacks European breeds of beef cattle in northern Australia. Zebu breeds are better able also to endure hot and arid conditions, but without a drastic change in the tenure system of Australian ranchlands, with a consequent improvement in methods of pasture and animal husbandry, the introduction of new strains will produce little, if any, extra beef.

These beef lands are of vast extent; the Northern Territory alone covers more than half a million square miles, yet there are only 118 productive pastoral leases. One district, about the size of Britain, has only 13 leases—held for a period of 49 years at 7s. 6d. per annum rental for each 1,000 acres. Single holdings run to thousands of square miles; some reach a million acres. Many belong to companies, whose directors reside mostly in other States or overseas—men who hold leases for what they can skim off them, not as blocks of land to be improved and developed.

The boundaries of holdings are usually unfenced; in many areas there are no fences of any kind.

Some of the largest properties do not even have cattleyards. For branding, the beasts are rounded up into mobs and lassoed—the irons being applied usually on the rump, where it does most damage to the hide. The cattle are not dehorned; they are "wild" beasts, unused to the presence of humans; and the damage they inflict on each other in these primitive musterings adds up to considerable loss.

Even greater depreciation comes from the haphazard methods of culling; in some areas it is not done at all. Better-class animals are rounded up for marketing, the "rejects" and weaklings being left behind on the properties to breed. Most areas are overrun with "scrub" animals, especially bulls—to the detriment of future beef production. Some measure of control is attempted by shooting off the scrubs—on one property more than 4,000 bulls were shot recently in this way.

Lack of Transport

Another heavy drag on Australia's beef potential is lack of transport in the interior. Over the entire half-million square miles of the Northern Territory, and a similar area adjacent to it, railroad and highway systems as we know them simply do not exist. Cattle are moved on foot, over difficult, arid country; and treks of 700 or 800 miles to the nearest railhead, followed by slow train journeys to the coast, are commonplace. It has been estimated that each beast loses up to one-third of its weight on these excursions, to which must be added the loss of many animals which die or escape *en route*.

One great hope for improvement in this aspect is the recent discovery of rich minerals—notably uranium—in Australia's northlands. This will hasten the construction of roads and railways and make them economically feasible. Livestock is a commodity which cannot afford high freight charges, or justify in its own right the huge capital outlay needed to build up transport systems. With these established, closer settlement and improved methods of animal breeding and management would follow. At best, however, this will be a long-term development—roads and railways are not built overnight—and meanwhile Australia may face the prospect of inadequate beef supplies for her own home needs.

Possibilities of Air Transport

To cope with this situation experts are now testing the possibilities of air transport to bring more beef out of the North, and to eliminate losses caused by long distance droving. In 1949 an Air Beef scheme was commenced at Glenroy, a small inland killing-centre, to transport carcasses to the State meat works at Port Wyndham, 184 miles away. During a five-month season, about 300 beasts are slaughtered each week at Glenroy. The beef is chilled and loaded into specially built Bristol freighters carrying a payload of six tons. At Wyndham the carcasses are frozen by standard methods and loaded into refrigerated hulls.

Since the chief aim of this scheme is to avoid long distance droving, the Glenroy killing station serves only the limited radius from 50 to 70 miles. South-west of Wyndham, and within a radius of 300 miles from it, is an area of some 250,000 square miles holding 50 aerodromes already constructed and available for use. Over past years this area has yielded 30,000 to 35,000 head of beef cattle annually for slaughter and processing at Wyndham. A similar number is sold to buyers, who drove most of them across country into Queensland. There they go by road or rail to meat works at the ports of Townsville and Rockhampton. The remainder go westward on foot to Derby, for shipment to Perth.

By the use of existing aerodromes and the construction of new ones it would be possible to eliminate long distance droving. This scheme also would permit the slaughter of beasts too weak to travel—a reversal of the present practice of sending away the stronger animals and breeding from the weaker ones. As back loads, fencing and other materials can be flown in, for the sub-division and development of holdings.

Statistics derived from a four-season operational run at Glenroy show the scheme to be entirely practicable and one that may make a very significant contribution to world food supplies. Present-day costs of air transport for the beef works out at 3½d. per pound, or £A7 per head for the average bullock. These costs should diminish as operations extend. The scheme is under the direction of Mr. I. H. Grabowsky, Planning and Development Officer

TABLE 1

	1949	*1950*	*1951*	*1952*
Cattle killed per annum:	1,776	3,676	4,080	5,186
Forward Loading				
Beef, hides, etc., air freighted to Wyndham and Derby in lb.	1,224,699	2,581,948	2,764,014	3,437,161
(*a*) Percentage increase in production to previous year.		210·8	107·1	124·3
(*b*) Percentage increase in production to 1949.		210·8	225·7	280·7
Back Loading				
Abattoir supplies, station stores, operating requirements, fencing materials, plant and machinery.	216,672	615,841	754,802	957,540
(*a*) Percentage increase in production to previous year.		284·2	122·3	126·9
(*b*) Percentage increase in production to 1949.		284·2	348·4	441·9
Total Freight Carried				
During killing season—May to September.	1,441,371	3,197,789	3,518,816	4,394,701
(*a*) Gross percentage increase in production to previous year.		221·9	110	124·9
(*b*) Gross percentage increase in production to 1949.		221·9	244·1	304·9

Beef loaded from a Bristol freighter at Wyndham Aerodrome into a refrigerated van for conveyance to freezers, from which it is shipped to Britain. *Photo F. H. Johnston Publishing Co.*

for Australian National Airways, who has supplied the following data.

Since the Air Beef scheme came into operation in 1949 it has achieved increased production each year and has encouraged development, as shown in Table 1.

Elimination of Waste

Approximately 40 per cent. of the cattle killed at Glenroy were beasts of a type which, because of their condition on the properties, had previously been unfit to drove and therefore had never previously been marketed. There are tens of thousands of such cattle roaming the North. Under the old system these animals in time die on the properties. Under the Air Beef scheme they are converted to beef and afford profit for the grazier.

The high quality, high valued meats carried by the cattle on the properties are thus conserved.

For what is believed to be the first time in the history of the cattle industry it has now been possible to establish fairly accurately the effects upon cattle of long walks to market. The following analysis has been made by comparing the yields obtained from one property which until 1948 marketed its cattle through Wyndham and since 1949 did so through the Air Beef abattoir at Glenroy, North-west Australia.

Cattle marketed *via* Air Beef were from exactly the same stock as those marketed *via* Wyndham. The increased general production and yield of beef per head has not been the result of property improvement or better breeding; effects of these will not be noticed until the 1955 season.

Table 2 covers the gross output and production of the Mt. House property in the Kimberley district. The comparison of 2,061 head of cattle marketed in the three-year period through Wyndham, with the 5,577 head marketed by Air Beef, does not give a true comparison for average beasts, because the 2,061 head were specially drafted, and represented the best cattle on the property, whereas among the 5,577 head quite half were cattle of a type previously unmarketable. Such animals comprise aged breeding cows, aged bulls, aged bullocks, cattle which were bad doers, scrubbers, barren cows, and the like.

Shown in Table 3 is a comparison of a similar mob of cattle off the same property drafted on similar principles. In 1947 the marketing was through Wynd-

TABLE 2

COMPARISON OF PRODUCTION OVER TWO EQUAL PERIODS OF THREE YEARS

	Droving to Wyndham 1946-47-48	*Via Air Beef 1949-50-51*
Number of cattle marketed.	2,061	5,577
Average frozen weight of carcass (Wyndham frozen weight). Lb.	519·1	552·3
Percentage graded as 1st and 2nd Export Quality.	40·1	71·5
Total Beef Produced. Lb. frozen weight.	1,064,727	3,080,269
1st and 2nd Export Quality Beef. Lb. frozen weight.	428,967	2,201,962
Yield per beast 1st and 2nd Export Quality. Lb. frozen weight.	209·15	394·82
Yield per beast small goods and canning. Lb. frozen weight.	309·85	157·48

TABLE 3

COMPARISON SIMILAR MOB NUMBER, SIMILAR DRAFTING, SIMILAR SEASONS

	1947	*1949*
Nature of season.	Average	Average
Number of cattle.	1,064	1,098
Percentage graded as 1st and 2nd Quality Export.	25·2	83·1
Average frozen weight of carcass	510	590
Total beef produced. Lb. frozen weight.	542,544	647,952
1st and 2nd Quality Beef. Lb. frozen weight.	136,659	538,421
Yield per beast 1st and 2nd Export Quality. Lb. frozen weight.	128·43	490·36
Yield per beast for small goods and canning. Lb. frozen weight.	381·48	99·75

TABLE 5

	After 300-mile Walk	*Via Air Beef*
Loss of weight per beast.	57·78 lb.	Nil
Percentage of mob loss (cattle not reaching destination).	15·00	Nil
Average carcass frozen weight. Lb.	527·22	600
1st Grade Export Quality. Lb. frozen weight.	13·61	146·16
2nd Grade Export Quality. Lb. frozen weight.	159·22	312·72
Small goods and canning. Lb. frozen weight.	354·39	135·12

ham, in 1949 through Air Beef. This analysis provides a fairer basis for assessing the merits of inland killing, and its effects upon quality and yield per beast.

To obtain a fair and conservative comparison the mean of Tables 2 and 3 is now given (Table 4).

TABLE 4

MEAN OF TABLES 2 AND 3. YIELD PER BEAST

Frozen Weight	*1947 lb.*	*1949 lb.*
1st and 2nd Export Quality.	168·79	442·59
Small goods and canning.	345·57	128·61
Loss of weight.	56·6	Nil

From the foregoing, and from information obtained through Air Beef and the Mt. House Station, it was possible to establish the average yield per beast in cattle killed at Air Beef averaging 600 lb. frozen weight, and compare the same mob after a theoretical drove of 300 miles; also to assess the effect of such a drove on the physical condition of the average beast in the mob (Table 5).

The Drought

Without air transport, it is doubtful whether the area under review would have marketed 800 head of beef cattle in the 1952 season. In actual fact there was an increase from 4,080 in 1951—a good season—to 5,186 in 1952, a drought year. This represents a gain in output of 27 per cent., compared with a loss of some 40 per cent. experienced by the Wyndham meat works.

Furthermore, all the Air Beef cattle killed out well. A mob of 134 from Gibb River killed and graded at an average of 664 lb.

From a mob of 200 off Mt. House Station, 40 of the best killed were 1st Grade Export Quality and weighed out at from 820 lb. to 960 lb. per carcass.

Conclusion

Country that can produce this class of beast from stock, into which no new improved blood has been infused for many years, can no longer be classified as breeding and store country. Given a reasonable outlet, it can produce good beef cattle. Since inland killing has proved able to retain the quality on the beast, there is incentive and justification for better breeding, and for all-round improvement in methods of management. With better breeding the country will produce prime cattle—which should be marketed when first prime.

After a recent tour covering many thousands of miles by air, and some 1,000 miles by road, one expert reports that there is ample dry grass in Australia's northlands to carry more than the cattle already there. The high death rate has been due to insufficient artificial watering points to augment the limited natural storage.

Sicilian Fish Liver Oil

IN THE waters of the Ionian Sea near the Strait of Messina there is an abundance of a species of medium-sized shark known locally as cow-fish and scientifically identified as *Hexanchus Griseus, Raf.* Since time immemorial the primitively extracted liver oil has been famed for its rapid healing action on wounds, ulcers, varicose veins, suppurations, and skin ailments, but the idea of systematic exploitation has only recently received serious consideration, following a study of its chemical and physical properties by workers at the University of Messina, a preliminary report of whose findings are presented by F. Monforte and G. Fenech in the June, 1952 issue of *Chimica e Industria*. The oil sample on which analyses were performed weighed 6½ lb. and was extracted from the 13 lb. liver of a 75 lb. cow-fish. The data in the Table were obtained.

The vitamin A content of the fresh oil is considerably higher than that of cod liver oil (1,000 I.U.). In the course of a few months the figure is halved, and after two years it falls to zero (the storage conditions are not specified in the report).

In hydrogenation experiments the liver oil readily underwent hardening by treatment with hydrogen for 1½ hr. at 250°C. in the presence of nickel formate, the melting point then rising to 43°C.

The authors sum up by saying that the high vitamin A content, the non-drying character, and the ease of hydrogenation and refining all combine to make the oil potentially attractive as a basis for lubricants, soaps, candles, foods, and pharmaceuticals. In fact, it is believed that modern fishing and processing techniques could make Ionian cow-fish oil the basis of a large scale local industry.

OIL ANALYSIS FROM COW-FISH LIVER

Colour	*Fresh oil light yellow*	*Aged oil reddish-brown*
Solidifying point	+10° to +2°C.	+10° to +4°C.
Specific gravity at 20°C.	0·9041	0·9214
Refractive index at 22°C.	1·4625	1·4635
Rotary power at 20°C.	−2·4	−3·03
Melting point of fatty acids	29°-32°C.	22°-23°C.
Acidity (% oleic acid)	0	9·78
Iodine value (Hübl)	87·3	62
Saponification value	141	123·7
Acetyl value	96	70
Ester value	141	104·3
% Squalene	0·275	0·035
Vitamin A content (I.U. per g. of oil), mean of many determinations	2123	0

The Bacteriological Examination of Canned Ham

Part II

R. Buttiaux

Chef de Service, Institut Pasteur de Lille (France)

Two fundamental rules of general bacteriology must not be disregarded in any microbiological study applied to food hygiene—isolation and identification of the causative organism. In this second and final part of his paper, the author discusses the pathogenic organisms which are the greatest danger to canned meat products, and methods used for their identification.

IN canned hams of good bacteriological quality, it sometimes happens that the contents of the can are sterile; in the author's experience this has occurred in 30 per cent. of the cans examined. The number of dead organisms in direct smears is small.

Normally, the production is unsterile, but the viable organisms, which may be grown on a suitable medium, are few (1 to 10 per 1 g. of sample). The numbers of dead organisms found in stained smears are few (one in three, four, or five microscopic fields with an immersion objective). The organisms isolated nearly always belong to the following families:

1. *Bacillaceae:*

Mesophilic or facultative thermophilic Bacilli:

B. subtilis, B. cereus are the most frequent and *B. pumilis, B. coagulans, B. sphaericus* are rarer.

Thermophilic Bacilli:

B. thermoamylolyticus, B. thermoindifferens, B. thermodiastaticus, B. calidolactis, are very frequent.

2. *Lactobacteriaceae:*

Streptococcus faecalis, Streptococcus thermophilis.

Clostridia or other strict anaerobes have rarely been found in canned hams which have not shown signs of change during prolonged storage. However, in two cases out of more than 600 examined, *Inflabilis* (Prevot), which have been completely tolerated, have been isolated.

From the point of view of public health, dangerous bacteria may be divided into two categories:

(*a*) Organisms which are pathogenic to man or which produce toxins.
(*b*) Organisms capable of rapidly altering the quality of the product.

Paper read at the Second International Congress on Canned Foods organised by the Permanent International Committee on Canned Foods.

The most important of the pathogenic organisms is *Clostridium botulinum* and the botulinus toxin. Although this is found fairly frequently in raw hams prepared by individuals, it appears to be rare in cooked canned hams. However, botulism is still the greatest danger in pasteurised canned meat products, and all the efforts of the bacteriologist should bear on a systematic search for this *Clostridium* and its toxin.

The *Salmonella* are always possible contaminants. They are carried to pasteurised pork products either in the meat itself or by carriers. Their occurrence is not very frequent, and pasteurisation has obviously a marked effect on these non-heat resistant organisms. *S. typhimurium* has been found in a sample of small ham.

Enterotoxic staphylococci nearly always come from skin lesions of the workers who prepare the ham and some of them may be slightly heat resistant, which makes them more difficult to destroy during pasteurisation.

Blown Cans

Although in the majority of cases the bacilli are completely tolerated, certain types exist which may produce blown cans. Jensen, Wood, and Jansen drew attention to this in 1941, and it was recognised that by an anomaly in their metabolism these bacilli produced large quantities of carbon dioxide by fermentation of sugars. Gibson in 1943 showed that this process could be carried out *in vitro* by culturing them in neutral or alkaline medium containing a large quantity of a fermentable sugar and nitrate. Verhoeven[9] has shown more recently that marked swelling may be produced in canned ham without any sign of putrefaction by a spore forming bacillus which is a powerful nitrate reducer. In this case, nitrogen and nitrous oxide are more prevalent than carbon dioxide. It should not be forgotten, on the other hand, that *B. polymyxa* is able in some cases to ferment sugars with gas production. Among the thermophiles, the author has seen one batch of swelled hams, due to *B. michaelisii*. This gives a rapid reduction of nitrate with the production of gaseous nitrogen. Generally the thermophilic bacilli are without any obvious action on canned meats stored at less than 30°C. and this has been checked by a large number of experimental inoculations.

Effect of *Clostridia*

The *Clostridia* are responsible for nearly all changes occurring in canned hams, particularly those causing swelling. Three types most frequently found are: *Cl. perfringens*; *Cl. sporogenes*; and *Cl. bifermentans*.

One can also find anaerobic thermophiles which are facultative or obligate. They are not very harmful at normal storage temperatures, but may become so in warm countries. Their bacteriological study is still incomplete, and those which have been isolated have not been identified with certainty.

In all cases, the *Clostridia* are found in badly prepared products. The source is assumed to be infected meat or meat coming from animals slaughtered too long before brining, preparation with dirty utensils or equipment, bad quality brines, or heavily infected gelatine. Pasteurisation does not destroy the spores of the *Clostridia*

and their great heat resistance is well known, especially that of *Cl. sporogenes*; Aschehoug and Jansen have again drawn attention to this.[10]

The *Enterobacteriaceae* (other than *Salmonella*) should never be found in canned hams, but those which occasionally infect them belong mostly to: *Escherichia* (*Escherichia coli, Escherichia intermedium, Escherichia freundii*); *Klebsiella* (*Aerobacter aerogenes* or *cloacae*); *B. paracoli aerogenes* (also known as *Paracolobactrum*) or *anaerogenes*; and *Proteae* (*Proteus vulgaris* or *mirabilis*).

These always produce marked swelling of the cans, and their presence is due to the same mistakes as those pointed out for *Clostridia*.

Clostridia and *Enterobacteriaceae* make the hams inedible. They produce a putrid smell and a marked proteolysis; the contents of the can may be toxic both to man and to animals.

The *Lactobacteriaceae* have been found to occur fairly frequently in pasteurised canned meats of good bacteriological quality, *e.g. Streptococcus faecalis* (*Enterococcus*). Their presence is not dangerous. Dack and his collaborators[11] have shown that large numbers of these organisms taken by human volunteers produce no pathological symptoms. They do not change the appearance or the edibility of the product. On the other hand, *Streptococcus liquefaciens*, an aerobe or facultative anaerobe, is capable of producing slow but marked liquefaction of jelly. The author has found several contaminations by this streptococcus and it should be prevented.

Bacteriological Examination

A method which enables the various types of microbial contaminants to be shown in the most rapid, obvious, and simple manner has been used for nearly four years at the Food Hygiene Service of the Pasteur Institute at Lille, with complete satisfaction.

The can is incubated at 40°C. for 24 hours. It is placed in the incubator with the rind side uppermost so that the gelatine while melting will wash the opposite surface of the ham and the organisms in the meat can reach this quickly and develop. Every can showing swelling, after the incubation, is of bad bacteriological quality. On the other hand, the unswelled cans are not necessarily of good quality. At this time, small leaks in the can should be looked for with the greatest care.

After sterilising the side of the can opposite to the rind, two holes are made in it:

(*a*) A lateral one which is used to remove some melted gelatine with a 20 ml. sterile Pasteur pipette.

(*b*) A central one through which is removed a fairly large cylinder of meat. This should be taken from the whole height of the ham. The gelatine and meat are then placed in a sterile mortar and coarsely mixed. The sample should weigh about 30 g.

The mixture of meat and gelatine is inoculated in the following way:

(*a*) About 2 ml. in each of two tubes (22 × 22) of Rosenow medium. Their surface is covered with a layer of sterile melted paraffin about 1 ml. thick.

(*b*) About 2 ml. in each of two tubes (20 × 20) of sodium thioglycolate medium.

(*c*) About 2 ml. in each of two tubes (20 × 20) of tryptose (Difco) broth.

(*d*) About 5 ml. in a (20 × 20) tube of acid sodium selenite medium.

(*e*) Six to 7 drops on the surface of some Chapman's medium run into a Petri dish.

One tube of Rosenow medium, one tube of thioglycolate medium, one of tryptose broth, one of selenite, and the Petri dish of Chapman's medium are incubated at 37°C.

One tube of Rosenow medium, one of thioglycolate, and one of tryptose broth, the latter two having previously been sealed, are incubated at 55°C.

The Rosenow, thioglycolate, and tryptose broth tubes are examined every 24 hours.

Growth is shown on the former by a change to pink or bright red (organisms fermenting glucose) with or without gas production which lifts the paraffin wax plug, or by the appearance of turbidity (non-glucidolytic organisms).

The tryptose or thioglycolate media show growth by the presence of a small or a marked cloud or by flocculation. As soon as microbial growth is suspected in one or other of the tubes, a Gram stained smear of the culture is made. The organisms are then separated by culture on to solid media: tryptose agar aerobically and gelatine-agar or V.F. agar medium anaerobically. They are incubated at 37° or 55°C. according to the temperature at which the original growth occurred.

After 48 hours at 37°C. a loopful from the selenite medium is streaked on to plates of S.S. agar (Difco) or desoxycholate-citrate-lactose agar. These are incubated at 37°C. and examined 24 hours later. All suspected colonies (whitish colonies with or without a black centre) are subcultured on to the quick diagnostic medium of Kliger or Hajna.

The Chapman medium is examined after 48 hours at 37°C. The colonies having the appearance of *Staphylococci* and which ferment mannitose (a yellow ring) are subcultured on to ordinary nutrient agar which is again incubated at 37°C.

The successive isolations from the solid media inoculated from the Rosenow thioglycolate or tryptose medium are carried out by the usual aerobic or anaerobic techniques. The organisms isolated are then identified.

The biochemical and antigenic properties which allow of the identification of *Salmonella* and other *Enterobacteriaceae* are looked for on the subcultures on to the Kliger or Hajna medium.

On the *Staphylococci* rapid tests for toxicity should be carried out —coagulase, haemolysis, or fermentation of mannitol. It takes too long and is too complicated in normal routine work to look for enterotoxins. In fact, guinea pigs are usually inoculated subcutaneously with about 2 ml. of the mixture of gelatine and meat. This is the only rapid and certain method of demonstrating the presence of botulinus toxin in the food examined.

Choice of Culture Media

All the media used in this analysis are known to bacteriologists. Rosenow medium[12] described in 1919 is still, in the author's opinion, one of the best for the development of all aerobic and

anaerobic bacteria which are difficult to grow when first put into artificial media. Like thioglycolate broth, it produces at the same time conditions which are both sufficiently aerobic and anaerobic. The use of these two media therefore does away with the complicated apparatus previously used for the culture of strict anaerobics. It is known that in the differential diagnosis of numerous types of bacilli, the position and the shape of the spores have great importance. It is also known how slowly these latter sometimes develop from the vegetative forms. It has been noticed for a number of years that all the bacilli form spores with great rapidity on tryptose media, a peptone prepared by the Difco Laboratories. That is why its use is recommended in the examination of canned hams where bacilli are so often found.

Identification of *Salmonella*

Acid sodium selenite and Muller-Kauffmann media are designed for the enrichment of *Salmonella* in faecal materials or other products containing large numbers of bacterial types. Like S.S. agar and desoxycholate-citrate-lactose agar, they sharply inhibit the growth of lactose fermenting *Enterobacteriaceae* (particularly *Escherichia*) and completely that of all Gram positive organisms. Their value in this connexion will be understood. The use of Muller-Kauffmann medium with sodium tetrathionate for identifying *Salmonella* in food products has been discontinued by the author. It gives a much smaller percentage of success than does the selenite medium. On this point, the author is in agreement with Cruikshank and Smith[13] that the use of selenite, or S.S. agar, and of desoxycholate-citrate-lactose agar will almost certainly reveal every *Salmonella* existing in a foodstuff. Their rapid identification, however, necessitates the use of rather special techniques.[14]

Halophilic Organisms

Chapman's medium contains 75 g. per 1,000 of sodium chloride—this makes it suitable for the culture of halophilic organisms of which the staphylococcus is one of the principal. It inhibits the growth of all the *Enterobacteria* but unhappily it permits the growth of large numbers of types of *Bacillaceae*. Its different applications in food bacteriology have been described elsewhere.[15, 16]

Formulae and Preparation of the Media

Rosenow's medium (for aerobic and anaerobic culture):

Tap water	1,000 ml.
Peptone (Trypsin digest)	10 g.
Liebig's extract	3 g.
Sodium chloride	5 g.
Glucose	2 g.
Andrade's indicator ..	10 ml.

The peptone, sodium chloride, glucose, and Liebig's extract are dissolved, adjusted to *p*H 7·2, filtered, and Andrade's indicator added:

Acid fuchsin	0·5 g.
Distilled water	100·0 ml.

If the *p*H of the glucose is right, the liquid is pale pink; if the *p*H is too low, the liquid is bright red, and it should be adjusted in this case by the addition of very dilute soda. The solution is placed in 22 by 22 tubes, about 20 ml. in each tube, in which has first been placed one small bit of white marble and one small piece of beef or sheep brains, first hardened in cold store, and from which the meninges and superficial blood vessels have been removed. The whole is sterilised in an autoclave for 20 minutes at 115°C.

Thioglycolate medium (modified Brewer formula) (for aerobic and anaerobic culture):

Meat broth (not peptised)	1,000 ml.
Extract of yeast ..	5 g.
Peptone (Trypsin digest)	10 g.
Sodium chloride ..	5 g.
Potassium phosphate	2 g.
Glucose	5 g.
Powdered agar ..	1 g.
Sodium thioglycolate	0·5 g.
Methylene blue ..	0·002 g.

The ingredients are dissolved by gentle heating, adjusted to *p*H 7·2, and filtered hot. The solution is put into 20 by 20 tubes with a depth of at least 10 cm. of medium in each tube. The whole is sterilised for 15 minutes at 120°C. The methylene blue colours green the upper aerobic zone of the tube, but this should not have a depth of more than 2 cm.

If the Rosenow or the thioglycolate medium are not used the same day as they are made, they must be regenerated before inoculation. This can be done by putting them for five to 10 minutes in a boiling water bath. They are rapidly cooled in water under the tap.

Tryptose medium:

Liebig's extract of meat ..	3 g.
Tryptose (Difco)	10 g.
Sodium chloride	5 g.
Glucose	4 g.
Water	1,000 ml.

The ingredients are dissolved, adjusted to *p*H 7·2, boiled, and filtered. The solution is filled into 20 by 20 tubes and sterilised for 15 minutes at 120°C. A nutritive tryptose agar may be obtained by adding to the above broth 15 g. of powdered agar per 1,000.

Acid sodium selenite medium:

Sodium selenite	4 g.
Peptone (Trypsin digest)	5 g.
Bisodium phosphate ..	10 g.
Lactose	4 g.
Distilled water	1,000 ml.

The whole is dissolved by gentle heating and put into 20 by 20 tubes so as to have a depth of medium of at least 12 cm. Sterilisation is effected by heating in steam at atmospheric pressure for 30 minutes—never autoclave. Storage at 40°C. is preferable (when it may be used over several months) or at room temperature in the dark. Samples inoculated into this medium should be well emulsified.

The *Salmonella* grow particularly in the deeper layers and it is at this level that the loop for subculturès on to selective media must be introduced.

S.S. agar is prepared in dehydrated form by the Difco Laboratories. It may be replaced by desoxycholate-citrate-lactose agar whose method of preparation may be found in any modern textbook on bacteriology or in one of the author's publications.[14]

The formula for Chapman's medium can be found in any recent work on bacteriology. It is also to be found in some of the author's previous publications.[16]

The manufacture of canned ham necessitates the strict observation of certain indispensable precautions in order to produce an article

of good bacterial quality. Like all pasteurised canned meats, it may be contaminated by numerous and varied organisms.

The type of bacteriological examination suggested may appear complicated, but it has the merit of showing up in every case, and without possibility of error, pathological organisms, and all those which might cause changes in the canned product. In every microbiological study applied to food hygiene, the two fundamental rules of general bacteriology must not be disregarded: isolation and identification of the causative organism.

That is why the much simpler examination for putrefactive, indologenic, and proteolytic organisms has been systematically abandoned. A complete bacteriological study is not only of major interest in public health control, but it also enables valuable service to be given to the manufacture. The identification of any spoilage organism leads to the source of the contamination, and to know this is the most certain way of rapidly removing it.

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FUTURE ARTICLES

ARTICLES to be published in forthcoming issues of FOOD MANUFACTURE will include an illustrated description of a Plymouth food factory, Part II of Mr. F. A. Robinson's article on "The Vitamins," Part IV of Mr. G. Saville's article "Transport and the Food Industry," and "Lactic Acid Bacteria in the Meat Industry."

Modern Bakery

THE Siebel Institute of Technology in Chicago has for many years been a centre for the teaching of the science and technology of baking. One contribution which it made in this direction over 30 years ago was the publication of "Siebel's Manual for Bakers and Millers." Since the appearance of that treatise, our knowledge of the fundamental science of cereals and of goods made from them has increased tremendously and, hand in hand with that increase, has gone a marked advance in milling and baking technology.

The early Siebel manual is now very much out of date, therefore, and the Institute is wise in its decision to replace it by a publication* which presents a modern picture of the facts, theories, and practices relating to baking. The book which accomplishes this has been written by E. J. Pyler, Editor of the *Bakers' Digest*, aided by the staff of the Siebel Institute.

When William Jago in 1911 published "The Technology of Breadmaking," a compendious treatise which was the first good and comprehensive book on the science and technology of baking, he devoted a number of the early chapters of the book to elementary science. This would seem to have set a fashion which has been followed by a number of subsequent authors of similar books.

A Dual Purpose Book

It is, however, a difficult task to keep such a dual purpose book within a reasonable compass; if the section on basic science assumes that the reader may have almost no knowledge of this subject, and hence starts at a very elementary level, then the book will be of inordinate length if a reader who needs this section is to be able to understand fully the science of the later sections when he reads them. So often unwieldiness is avoided by omitting some of the transitional science, with the result that the book contains chapters on the science and technology of milling and baking and chapters on elementary basic science but nothing to serve as stepping stones between.

In the reviewer's opinion there are two ways of dealing with this problem; one is to cover only the science and technology of baking and to include no chapters on elementary science, *i.e.* not to make the book a dual purpose one, and the other is to assume a reasonable standard of scientific knowledge in the reader so that the chapters on basic science need be few and not too elementary.

The author of the book under review has adopted the second method, and has assumed in his readers a knowledge of science equivalent to that normally acquired by passage through an American High School. This approach has resulted in a book which does not show that lack of balance between the sections on chemistry and on the science and technology of baking which so often characterises books of this type.

Basic Science

The division of the subject matter between the two volumes is convenient in that Volume I is concerned with theory and Volume II with practice. Volume I deals first with the basic science appertaining to the making of bread and confectionery, and then reviews the raw materials used by baker and confectioner. Volume II is concerned with the practical aspects of bread and cake-making.

Part I of Volume I, which is devoted to basic science, comprises chapters on carbohydrates; fats and oils; proteins; enzymes; vitamins; yeast, moulds, and bacteria; and aspects of physical chemistry. These chapters are generally well presented, and their subject matter should be readily assimilable by readers whose formal education has reached the standard anticipated by the author. The reviewer finds little to criticise in this section of the book, but would comment upon the absence of a reference to the

* *Baking Science and Technology*. By E. J. Pyler. Vol I, pp. xvi+382. Vol. II, pp. ix+421. Siebel Publishing Co. Price $15.

improving action of ascorbic acid in the section on vitamins and the omission of the degree of magnification from most of the photomicrographs.

Bakery Materials

The second part of the first volume covers the "materials of baking," and comprises chapters on wheat flour; miscellaneous flours; sugars and syrup; plastic baking fats; milk and milk products; egg and egg products; and water. The ground is generally well covered, and this section contains much information which can help toward a better understanding of the operations and phenomena involved in the production of bread and confectionery.

Technology in the Bakery

The first part of Volume II discusses baking technology, and its chapters are devoted to dough mixing; fermentation; dough make-up; the baking process; rye bread production; bread staling; and physical and chemical testing methods. It is a good plan to devote a separate chapter to each operation involved in the bread-making process and to discuss these in the order in which they are performed in the bakery. The second part of this volume is devoted to the technology of cake-making, and its four chapters deal respectively with cake ingredients; flavour; cake baking technology; and miscellaneous baked products. The chapters in these two sections which deal with technology are very practical in their approach and are well written. A close study of them would well repay both the student and the keen operative.

Equipment and Sanitation

The third and last section of Volume II deals with bakery equipment. The author has devoted a separate chapter to each of the main groups of operations involved in the conversion of flour into the finished baked product, and the subjects treated are flour handling equipment; dough handling equipment; oven equipment; and cooling, slicing, and wrapping equipment. These chapters are comprehensive in their scope and are well illustrated with photographs.

The final chapter of this section has for its subject bakery sanitation, a subject to which insufficient attention has been given in the past. No effort should be spared to ensure the best of hygiene and housekeeping in any premises devoted to the production or preparation of foodstuffs, but this is particularly necessary in the U.S.A. where purity standards are in force which have not been adopted in Britain. The author of this chapter on bakery sanitation, Dr. E. L. Holmes of the American Institute of Baking, has dealt with the subject thoroughly and ably.

The reviewer would disagree with a few statements in the book; for example, the relative importance of the causes of acidity production in bread dough and the effects of some bleachers and improvers, but the points of disagreement are very few. Misprints also occur but rarely. Commendation is deserved also for the standard of the printing and the quality of the paper upon which the print appears.—A. J. Amos.

New Techniques in Olive Oil Extraction

Some 30 years ago the Marquis d'Acapulco collaborated with the Spanish agricultural engineer, G. Quintanilla, in designing the first olive oil extractor, utilising the capillary principle combined with filtration through a metallic screen, thus achieving the first notable departure from the traditional process of expression followed by discharge of the oil through a screen of vegetable fibre. The problem of isolating the oil without serious contamination has continued to engage the attention of workers in all the chief olive growing countries.

Among the methods devised have been the rotating filter of Segura, the proposal of Kues-Finnaro for leaching with dilute sodium carbonate, as well as the well-established centrifugal processes, the latest form of which is being employed in French Morocco and Tunisia.

In all the mechanical processes, substances of the nature of pectins, mucilages, etc., offer increasing resistance to the release of oil as the operation proceeds. The idea of removing the "pectic cement" by the biochemical action of natural ferments presented itself to J. De Soroa (*Oléagineux*, Nov., 1952) following the experiments of Kilbuck and Museo in California on the expression of grape juice, which process was considerably facilitated by the use of the enzymatic preparation "pectinase 41 B."

Experiments giving encouraging results have been carried out since then in Spain, where it has been found that the fluidity of the pulped fruits is increased when using capillary extractors of the Huarte or Palacin type to extract the oil from those varieties of olive in which the pectic cement is particularly troublesome.

It is suggested that the efficiency of the older processes of capillary or centrifugal extraction can be improved by standardising the constructional materials so that repairs do not entail serious hold-ups during the season. Research will also be necessary into the enzymes most suitable for dealing with those varieties of olives whose oil is obstinately retained by the pectins.

Our Contemporaries

Articles published in the associated journals of the Leonard Hill Group this month include the following:

"Systemic Fungicides," by P. W. Brian; "Cultivation of Rice in Egypt" (*World Crops*).

"Demineralisation of Salt Waters" and "Utilisation of Solar Energy" (*Chemical and Process Engineering*).

"Instruments and Control Gear for Chemical Plant," by A. Thompson, M.D., and W. T. Thomas, B.A. (*Manufacturing Chemist*).

Fruit and Vegetable Storage in America

One of the main objects of the visit of the British Team which went to America under the auspices of the Anglo-American Council on Productivity and the Economic Co-operation Administration (now Mutual Security Agency) was to learn to what extent the Americans had developed techniques for storing fruit and vegetables without deterioration for relatively short periods. It became apparent that developments in America had been in response to a different set of circumstances from those operating in Britain.

AS a result of consideration of the way in which American methods could be applied in the British fruit and vegetable industry, the Team has issued its report* in which are contained many valuable conclusions and recommendations.

Much of the information presented in this report should prove of value to growers and those concerned with the distribution of fresh products. Naturally some of the practices seen have arisen as the result of special circumstances existing in America, and in connexion with certain pre-cooling and storage methods in particular, British growers and distributors are advised not to put them into full-scale use without first making trial experiments. Cultural and climatic conditions and the varieties of produce found in America may have had much to do with the techniques developed there.

Pre-cooling and Short-term Storage

Owing to the excellent system of refrigerated road and rail transport in America, fruit and vegetables tend to be grown under the most favourable conditions of soil and climate, regardless of distance between the areas of production and consumption.

Varieties of many fruits and vegetables have been bred to withstand long journeys, but improvement of outward appearance, of cropping capacity, and of resistance to disease rather than of flavour has also been an objective of the plant breeders.

The high summer temperatures have led to considerable research in, and use of, refrigeration at all stages from the producer to the consumer. Refrigeration is, however, still employed at times of the year when comparatively moderate temperatures prevail.

Owing to some extent to the high cost of labour, great use is made of the mechanical handling of produce by means of fork trucks and pallets, stillage equipment, and conveyor belts. Economy of labour is frequently obtained by the excellent layout of packing sheds.

Pre-cooling of fruit and vegetables is widely practised by the use both of water (hydro-cooling) and cool stores. Pre-cooling is found to be valuable with and without subsequent refrigeration. Hydro-cooling can provide a relatively cheap and rapid method of pre-cooling certain crops which remain undamaged by water.

Vacuum cooling has been used economically for the cooling of leafy vegetables such as lettuce. Its great advantage lies in its speed and the completeness with which such difficult products as lettuce are cooled throughout. Owing to the high capital cost of the equipment a long season of throughput is essential.

Disinfectants or fungicidal dips are useful in hydro-coolers and washing machines, particularly where the water cannot be frequently changed.

Waxing increases the market life of certain root vegetables.

Water ice is used to a great extent in packages containing such vegetables as lettuce and carrots which require a low temperature and high humidity to maintain their fresh condition. The large demand for water ice has resulted in its being readily available at a relatively low price.

Many of the most modern and best-equipped cold stores use brine sprays.

Despite certain aids to humidity control, efficient construction and adequate coil area remain the most satisfactory ways of maintaining high humidity.

While there is still a difference of opinion among research workers about the value of air purifiers, many practical users are convinced of their efficacy in reducing odours and scald and in extending the storage life of apples.

Ozonators are not now greatly used in fruit and vegetable stores.

The railway companies and road transport firms provide a very efficient refrigerated transport service at reasonable and economic charges.

The use of dry ice is particularly beneficial in the conveyance of soft fruit and mushrooms to the market as it is found that the carbon dioxide gas evolved aids preservation. Dry ice may be employed in transport vehicles that are refrigerated by water ice. To a limited extent it is being used as a refrigerant by itself.

Wholesale markets use cold storage:

(*a*) By holding produce in refrigerated rail trucks at the terminal station.
(*b*) By the use of cold stores of commercial storage companies.
(*c*) By using their own cold stores operated either by their own plant or by cooled brine pumped from a central plant at a service charge.

Many retail stores use cold rooms for holding produce and mechanically refrigerated, or ice-cooled, show-cases for displaying the more perishable produce.

Recommendations

Among the recommendations made on this subject are the following: Additional staff and other resources should be made available for increased research on all aspects of the handling, pre-cooling, and storage of fresh fruit and vegetables. This would benefit

* *Fruit and Vegetable Storage and Prepackaging*. Pp. 64+xii. British Productivity Council. Price 3s.

consumers, distributors, and growers, and would save foreign exchange by reducing the need for imports of these products.

Producers should make more use of cold stores for soft fruits and vegetables over short periods. At present, cold stores are used mainly for the long-term storage of hard fruits.

The provision of construction materials that are in short supply should be facilitated and, if necessary, credit facilities should be made available for approved construction programmes.

Such cold stores could also be used for pre-cooling and so help to compensate for the present critical shortage of refrigerated railway trucks. A more general appreciation of the great value of pre-cooling should be encouraged throughout the trade.

Pre-cooling facilities should be introduced into areas of concentrated production, particularly for use with soft fruits, cherries, etc. These facilities might be in the form of mobile cooling units used on a co-operative basis at some central point in the area such as a railway station, a growers' co-operative, or the premises of a local collection and despatch agent.

The use of a limited number of insulated vehicles is recommended for the carriage of those crops which derive the greatest benefit from cooled transport. Such crops would include soft fruits, cherries, plums, lettuce, broccoli, cauliflowers, etc. These vehicles should have provision for ice, solid carbon dioxide, or mechanical refrigeration for cooling, and should at first be devoted to the collection of economic data on their value and the disposition required to achieve their maximum use.

Crated celery being pre-cooled in a hydro-cooler.
Photo The Food Machinery and Chemical Corporation.

The Team was impressed by the value of hydro-cooling under American conditions and feels strongly that research in the possibilities of this process in the U.K. should be initiated. Research workers and manufacturers of washing machinery should consider designing an efficient and economic hydro-cooler. For British conditions a single machine which could be used for washing and/or hydro-cooling would probably be ideal.

Vacuum cooling is an effective process, but the equipment is costly and it is not thought that its use would be justified in this country unless a plant was erected at a centre where there is already available a supply of steam, as at a cannery, and where a long season of throughput is possible.

Growers and research workers should test the efficacy of fungicidal dips for vegetables and for the prevention of deterioration of top fruits from brown rot or other mould infections.

The amendment of any regulations prohibiting the use of such fungicidal dips as are non-toxic to human beings should be considered forthwith, as these dips have been in use for some time in America.

The value of the inclusion of package ice in crates of lettuce marketed in Britain has already been demonstrated experimentally, and this method of market-

Interior view of the plant of the Vacuum Cooling Company, Watsonville. Lettuce cooled to 32° to 34°F. is being placed on a conveyor for loading into refrigerated rail cars.

Packing line in a prepacked tomato plant.

ing might be tried commercially, particularly during warm weather. It would entail the production of adequate supplies of reasonably priced water ice.

The work already being undertaken on the use of dry ice for the conveyance of soft fruits to the market should be continued and extended. The inclusion of dry ice in pre-cooling stores for treating soft fruits prior to consigning them by rail or road should also be investigated. Dry ice might prove of value as a refrigerant either when included as small units in master containers or for cooling insulated rail trucks and lorries.

Any new wholesale markets should consider the erection of a central cold store and the distribution of cooled brine to tenants' warehouses.

In the construction of new cold stores consideration should be given to the use of brine sprays, always bearing in mind the problem of corrosion of the metal parts of the equipment.

Wholesalers should realise the enhanced value of pre-cooled produce and should be encouraged to erect and use cold stores for home-grown produce. By the use of efficient layout and mechanical aids for loading in and out of storage, handling costs could be reduced.

Greater use of cold rooms in the first instance is advocated for retailers; this should help to reduce waste and even out market prices throughout the week. The use of mechanical refrigeration or ice-cooled display cases for vegetables, salads, and soft fruits should encourage sales by the better presentation and fresher condition of the produce on sale. This would be a step towards the ideal of a chain of cool storage right through to the consumer. If possible, credit facilities should be made available for these installations.

More attention should be given to the introduction of efficient methods of controlling humidity, and to the automatic recording of humidity data, in cold stores.

Prepackaging

Prepackaging as a method of handling fresh fruits and vegetables is being practised on an increasing scale, but it is by no means universal and the greater part of produce is still sold from bulk.

The main reason for the growth of prepackaging of fruits and vegetables is that it assists the retailing of these products in self-service stores. It not only enables produce to be packed in convenient units for sale, but also reduces damage resulting from the mishandling of goods by the customer.

Prepackaging is of particular benefit to the consumer where some form of "kitchen service" such as the trimming and washing of certain vegetables is provided, thereby eliminating waste and labour in the housewife's own kitchen.

The packing and/or concealment of produce of poor quality in wrapped packages does cause suspicion of prepackaged produce resulting in sales resistance.

The point at which prepackaging is done depends, among other things, on the perishability of the produce, the distance between producer and consumer, and the availability of labour in the chain of distribution. It is not carried on to the same extent throughout the year, but is largely discontinued during the periods of high temperatures experienced during summer in America.

Advantages of Prepackaging

It is claimed that prepackaging reduces waste. The removal of the unusable parts of produce before it reaches the consumer may bring about a saving in the transport of waste material, but there is no evidence that prepackaging results in a higher proportion of the field crop being consumed. The discarding of waste earlier in the chain of distribution can be of value in itself.

Although some research work

has been done on the effects of different wrapping films on particular products, packers generally use the one most economical or readily available; more attention is paid to strength than to such factors as permeability to moisture vapour.

Very little use is made of plain transparent film, since the American customer does not appear to dislike condensation inside the packages when partially moisture-proof films are used. Although it is recommended that such films should be perforated, frequently this is not done in practice.

Prepackaging is stated to save labour, but there is some evidence that it transfers work from one stage in the distribution chain to another. It may, however, reduce labour costs in so far as it permits mechanical methods to be applied to packing and wrapping.

It is probable that with the somewhat limited present knowledge of the effect of different films on particular products, it is the careful selection and continuous refrigeration of the product that are the main causes of any additional shelf-life that the packages may have.

Packing materials are generally cheaper in America than in Britain in spite of higher labour costs

American growers and packers have invested large amounts of capital in cold stores and packing equipment in the knowledge that it is only by having the latest machinery and appliances that they can meet intensive competition between themselves.

Recommendations

As a preliminary step it is suggested that there is scope for the trial prepackaging of the following products: spinach, mixed salads, tomatoes, choice dessert apples, peaches, dessert plums, brussels sprouts, and mushrooms. Growers and co-operative packing stations should despatch trial consignments over extended periods, particularly if they can provide "kitchen service."

Top-quality produce only should be prepackaged, and distributors should ensure that it is not offered

(*Concluded at foot of next column*)

for sale as prepackaged produce if held so long that it loses its condition.

There should be more research in the effects of different films and other packing materials on particular products.

The possibilities of the market for prepackaged fresh fruits and vegetables and the economics of prepackaging should be investigated, possibly by the appropriate branches of the Ministry of Agriculture.

Correspondence

To the Editor of
FOOD MANUFACTURE

Soya Bean Flour

DEAR SIR,—I am sorry to see that parts of Mr. Radley's article, "Chemistry and Physics of Macaroni Products," Part 6, in your January issue are grossly misleading.

On page 16 in the section headed Lipoxidase he says that "Lipoxidase . . . is present in large amounts in soya bean meal . . . it not only accelerates development of rancidity in fat but also causes loss of carotene, vitamin A, and ascorbic acid. The loss of carotene would lead to a dull coloured macaroni. If ever a manufacturer were tempted to include a small proportion of soya bean flour in his macaroni it would be of interest to recall that Haas and Rohm used such an addition for bleaching xanthophyll and Carotenoid pigments of flour doughs."

These remarks would be unexceptionable if Mr. Radley had made it clear that they refer only to enzyme-active soya flour or the raw bean. A manufacturer might well add a proportion of a *properly debittered soya bean flour* to his mix without running the risk of any of these changes and with great benefit to the protein content and nutritive value of his product.

The confusion which is already present in the minds of some people between the properties of raw soya bean and enzyme-active soya flour on the one hand and a debittered soya bean flour on the other can only be increased by the publication of such statements as were contained in the article referred to, and I feel sure that you would wish to publish this letter in order to correct the impression which the article must have given.

Yours faithfully,

E. MITCHELL LEARMONTH,
British Soya Products Ltd.

London

Mr. J. A. Radley writes:

I regret that Mr. Learmonth considers the statement in one paragraph of Part 6 of my article "Chemistry and Physics of Macaroni Products" to be misleading and ill-considered. A careful reading of the article would show that the term "soya bean meal" and "soya bean flour" in the paragraph obviously referred only to the enzyme-active soya flour or the raw bean since, by the context of the passage, the possibility of lipoxidase activity in wheat being responsible for the fading of colour in some durum varieties was being mooted.

It was not considered necessary, in view of the excellent advertising literature put out by Mr. Learmonth's firm and by others manufacturing debittered, enzyme-inactive soya products, to enlarge upon the availability of such material or its non-effect upon the colour of mixes since it was only the possible effect of lipoxidase that was being discussed.

Carefully processed de-activated soya flour would, of course, be free from suspicion with regard to the phenomenon discussed and may well have nutritional and other advantages, while the manufacturer who included enzyme-active soya flour, raw bean meal, or improperly de-activated soya material to his mix would be asking for trouble. The macaroni manufacturer in this country, however, only asks for good grade durum wheat or semolina, although in the East such admixtures with various unsuitable soya products have occurred, but have not survived.

The Vitamins

Progress in 1952

F. A. Robinson, M.Sc. Tech., LL.B., F.R.I.C.
Allen & Hanburys Ltd., Ware, Herts.

Part I

The year 1952, like its predecessor, has witnessed no new developments of outstanding importance in our knowledge of the vitamins, although the structure attributed to flavin-adenine-dinucleotide, the coenzyme which dehydrogenates coenzymes I and II, has been confirmed by a complex but elegant synthesis devised by Christie, Kenner and Todd. Very little additional information has been published on the structure of vitamin B_{12}, although the relationship between the different members of this group of substances is much clearer than it was. The citrovorum factor has now been shown to be N^{10}-formyl- and not 5-formyl-tetrahydrofolic acid, while the structure of an obscure member of the vitamin B complex, α-lipoic acid, has been established.

MOST of the papers published during the year have been concerned with the biochemical roles of the different vitamins—with the function of vitamin A in vision, with the reactions catalysed by pyridoxine- and pantothenic acid-containing enzymes and with the reactions in which vitamin B_{12} is involved.

Synthetic Vitamin A_1 and Vitamin A_2

Although synthetic vitamin A is now an article of commerce, a considerable amount of work is still being carried out to find improved methods of synthesis, and a large number of patents have been published during the year covering new routes and intermediates.[1] Vitamin A_2, which accompanies ordinary vitamin A in fresh-water fish, has been synthesised[2] and shown to be identical with a dehydro-vitamin A, having the structure:

The corresponding aldehyde (retinene$_2$) was also prepared. A study of the distribution of vitamins A_1 and A_2 in amphibia has shown[3] that whereas tadpoles and frogs store vitamin A_1 but not vitamin A_2, both forms of the vitamin are found in newts.

A new isomer of vitamin A, the so-called retro-vitamin A, has been synthesised.[4] In this compound the conjugated system is removed one carbon atom further back into the ring than in vitamin A; it has no biological activity. Neo-vitamin A, which occurs in fish liver oils and may interfere with the spectrophotometric assay of vitamin A (see below), has been obtained in a more concentrated form by repeated chromatographic adsorption.[5] It was converted into the corresponding aldehyde, neo-retinene, on oxidation. Neo-vitamin A is found in some fish liver oils to the extent of nearly 40 per cent. of the total vitamin A.

Further light has been thrown on the function of vitamin A in vision.[6] It is now believed that vitamin A is normally converted into rhodopsin by combination with opsin under the influence of alcohol dehydrogenase and cozymase.

Not all forms of this vitamin are active however, and the precursor of rhodopsin is probably one of the *cis*-isomers, the di-*trans*- and neo-forms becoming effective only after isomerisation by light in presence of a trace of iodine. Rhodopsin, when bleached with blue or violet light, is isomerised to an inactive isomer of retinene, which on further exposure is re-converted into rhodopsin. Yellow light, on the other hand, gives the inactive isomer but does not permit regeneration. It is thought probable that the eye must be continually supplied with the active isomer of vitamin A from the bloodstream, which is in turn supplied from the liver. The retina probably withdraws the active isomer and returns the inactive di-*trans*-isomer to the blood. Isomerisation of vitamin A *in vivo* probably proceeds at a pace sufficient to keep up an adequate supply of the active isomer.

Spectrophotometric Estimation

Considerable activity has been shown during the year in developing more accurate methods of estimating vitamin A spectrophotometrically.[7] Fish liver oils contain several forms of vitamin A which are not equally active; accordingly allowance should be made for the presence of these various forms of vitamin A in attempting to estimate the biological activity of oils by measurement of the absorption band at 328 mμ.

Substances which may interfere are anhydro-vitamin A, vitamin A_2, kitol, neo-vitamin A, epoxides and other oxidation products, and polyene acids. Polyene acids can be removed by saponification, while the amount of vitamin A_2 present can be determined by measuring the absorption at 693 mμ of the colour developed with antimony trichloride and then making an allowance for the contribution of that amount of vitamin A_2 to the absorption of the unsaponifiable matter at 328 mμ.

Vitamin A_2 has 40 per cent. of the biological potency of all-*trans* vitamin A and may account for up to 40 per cent. of the total vitamin A of a fish liver oil. Neo-vitamin A is more difficult to determine since it has an absorption curve similar to that of all-*trans* vitamin A although displaced 2 to 3 mμ towards the visible end of the spectrum. The presence of oxidation products results in a much greater

distortion of the absorption band. Cama, Collins, and Morton have developed certain correction equations for eliminating the effect of irrelevant absorption. These are derived from the absorption curve of all-*trans* vitamin A acetate in cyclohexane, but the assumption on which these correction procedures rest have been challenged, and it is probably not valid to apply the same equations to every type of oil.

Using the factor of 1,600 to convert values of $E^{1\%}_{1cm.}$ at 328 mμ into international units, the results obtained when the correction procedure of Cama, Collins, and Morton is used would probably undervalue oils showing little irrelevant absorption and overvalue oils showing much irrelevant absorption. Fresh cod liver oils give satisfactory results when they are saponified for 30 minutes and the $E_{328.5}$ mμ value for the unsaponifiable matter is multiplied by 1,600.

Chromatography on alumina or bone meal has also been advocated for removal of interfering substances, but the results are not always satisfactory. Oxidation products can sometimes be corrected for by making use of the so-called isosbestic point or point of constant absorption, which occurs at 290 mμ. By a comparison of the absorption at this wavelength of fresh oils and oxidised oils it is possible to estimate the effect of oxidation on the original vitamin A content of an oil. In general, it is probable that no simple method of correcting for all likely contaminants exists, but that different methods must be used according to the nature of the sample.

Evidence has been published showing that vitamin A esters are utilised more efficiently than the alcohol when administered in an aqueous carrier, whereas in an oily medium the free alcohol is utilised better than the ester.[8] Aqueous dispersions are said to be more stable than solutions in arachis oil.[9] Stable aqueous dispersions of vitamin A can be made with the aid of the polyoxyethylene ethers known as "Tweens."[10] An enzyme which can hydrolyse vitamin A ester to the alcohol has been shown to be present in rat liver.[11] It is thermo-labile and is inactivated by ethanol. Vitamin A aldehyde (retinene) has been shown to combine with normal human plasma.[12]

Synthetic Carotenoids

Synthetic 15:15′mono*cis*-β-carotene had half the potency of all-*trans*-β-carotene when fed to vitamin A-depleted rats and chicks.[13] In hens, however, the synthetic carotene was mainly destroyed, although some was converted into the all-*trans* compound. All the tocopherols diminished the storage of vitamin A in the livers and kidneys of rats fed moderate amounts of β-carotene.[14] The conversion of carotene into vitamin A in the rat takes place in the intestine even when this is free from bacteria, the transformation being effected enzymatically in the intestinal wall.[15] Synthetic 16:16′homo-β-carotene had 20 per cent. of the activity in the rat of all-*trans*-β-carotene; both the *trans*- and *cis*- forms of the homologue had a similar degree of activity.[16]

Estimation of Vitamin D

There is very little new to report in connexion with vitamin D. A new method of assay has been described[17] in which young rats maintained on a rachitogenic diet are given a test dose of vitamin D, followed by an injection of radioactive phosphorus. Ten days later the radioactivity of the paw of the animal is measured and this indicates the potency of the vitamin D preparation under test. Another new method of estimating vitamin D depends on the liberation of iodine on reacting with iodine trichloride.[18] This method suffers from the same disadvantage as several other chemical tests for vitamin D, in that vitamin A and carotene also react in the same way.

Renewed attempts to separate vitamins A and D quantitatively from one another have been made with not very great success.[19] Treatment with maleic or citraconic anhydride to remove vitamin A resulted in loss of vitamin D as well, and although selective ultraviolet irradiation can be used to destroy vitamin A the method cannot be used to separate the two vitamins. Paper chromatography has been successfully used to separate vitamin D from a mixture containing also cholesterol, 7-dehydrocholesterol, ergosterol, and other sterols.[20]

New precursors of calciferol and vitamin D_3, described as pre-calciferol and pre-vitamin D_3, respectively, have recently been reported.[21] They are made by irradiation of ergosterol and 7-dehydrocholesterol, and can be isomerised to calciferol and vitamin D_3 respectively. It has been shown that cholesterol is converted into 7-dehydrocholesterol by a dehydrogenase in the wall of the small intestine.[22]

A substance has been found in hay and dried grass which is said to interfere with the activity of vitamin D.[23] The presence of this substance may explain why such divergent reports have been published from time to time on the vitamin D content of dried grass, and why the vitamin has frequently been reported as absent from fresh grass. The factor is soluble in ether and petroleum ether and is resistant to saponification.

Vitamin C

Towards the end of last year a report[24] was published on the vitamin C reserves of British troops during the winter and spring of 1941-42. On the average, recruits had slightly better vitamin C reserves than troops, especially those coming from country districts. It was recommended that troops should be given more vitamin C, since those with the lowest reserves did not become saturated even after five or six 0·75 g. doses of vitamin C, although no symptoms of scurvy were reported.

A connexion between vitamin C and tyrosine has been established in both guinea pigs and humans,[25] and it has been suggested that the vitamin acts as the coenzyme in tyrosine oxidation. Vitamin C also appears to be necessary for the production of certain of the adrenal cortical hormones since in scorbutic guinea pigs an injection

of ACTH had no effect on arthritic symptoms.[26]

It has been claimed[27] that glucose will condense with aceto-acetate to give a furan derivative very similar in structure to ascorbic acid, and that this condensation product greatly enhances the growth of seedlings and may well be a precursor of vitamin C. A method of preparing ascorbic acid containing radioactive carbon has been described.[28]

Ascorbic acid gives a red colour with uranyl nitrate, which can be used for estimating it.[29] It can be separated from uric acid by paper chromatography, and its position in the strip located by means of *o*-phenanthroline.[30]

Aneurine not Anti-neuritic?

The revolutionary suggestion has been made[31] that lesions of the peripheral nerves, which have hitherto been ascribed to vitamin B_1 deficiency, do not, in fact, respond to treatment with vitamin B_1 and that in consequence vitamin B_1 should no longer be regarded as having anti-neuritic properties. The effect of vitamin B_1 in such cases is attributed to an analgesic action rather than to the correction of a nutritional deficiency, a view that will undoubtedly require confirmation before it becomes widely accepted.

Existence of New Enzyme?

Another novel suggestion is that a new aneurine-containing enzyme may exist, containing in addition the recently recognised vitamin known as α-lipoic acid.[32] (See below.) This coenzyme is claimed to catalyse the oxidative decarboxylation of α-keto acids. A protein fraction which catalyses the formation of co-carboxylase from aneurine and adenine triphosphoric acid has been isolated from rat liver.[33] More than 80 per cent. of the aneurine present in normal rat liver is phosphorylated, whereas in alloxan-diabetic rats only 36 per cent. is phosphorylated,[34] and it is considered probable, therefore, that the phosphorylation and hence the utilisation of aneurine are below normal in diabetes and are increased by insulin.

Enzymatic Inactivation of Aneurine

The inactivation of aneurine by thiaminases in shell-fish and bracken has been under investigation, and the principal pyrimidine derivative produced by clam tissue has been isolated and partly characterised; it has been given the name icthiamin.[35] The enzyme in bracken responsible for the destruction of vitamin B_1 has been split into a thermo-stable enzyme and a thermo-labile apoenzyme;[36] the same enzyme is present in male-fern and horsetail.

It has been shown[37] that in the activation of aneurine by this enzyme, aromatic amines, pyridine, quinoline, or naturally occurring amines can replace the thiazole moiety of the aneurine. Since aromatic and heterocyclic amines exhibited "co-enzyme activity" but had different degrees of activity with the apo-enzymes from shell-fish, fish, and bacteria, it was thought probable that the natural co-enzyme of thiaminase is a primary aromatic amine which exchanges with the thiazole moiety of aneurine.

Estimation of Aneurine

Several new methods of estimating aneurine have been proposed, some of which are modifications of existing methods. In the estimation of urinary aneurine by the thiochrome method, for example, blank values are obtained more simply than in other methods by treatment with benzene sulphonyl chloride.[38] Again, aneurine can be estimated microbiologically in capillary tubes instead of petri dishes, enabling very much smaller quantities to be measured.[39] A similar method can be used for estimating riboflavin, nicotinic acid, and pantothenic acid.

New methods of assay have been described in which aneurine salts are titrated with perchloric acid;[40] in which aneurine is oxidised with mercuric chloride under controlled conditions;[41] and in which the fluorescent compound formed by the action of cyanogen bromide on aneurine is measured.[42]

Solutions of vitamin B_1 are said to be stabilised by the addition of small amounts of thioglycerol, thiosorbitol, or thioglucose.[43] Aneurine containing radioactive carbon has been prepared for use in metabolism studies.[44]

Excretion of the Vitamin B Complex

The excretion of five members of the vitamin B complex following the administration of appropriate test doses has been investigated.[45] The amount of aneurine excreted was substantially lower in deficient patients than in control subjects, but neither aneurine excretion nor riboflavin excretion was significantly diminished in patients with clinical evidence of vitamin B complex deficiency.

The excretion of nicotinic acid metabolites was markedly reduced in vitamin B complex-deficiency, and the test dose procedure appears to be useful in evaluating nutritional studies in regard to aneurine and nicotinic acid, but of less value with respect to riboflavin, folic acid, and pyridoxal. One-half to three-quarters of a dose of aneurine given by mouth in the form of tablets was excreted in the faeces.[46] Evidence has been presented that aneurine as well as riboflavin, nicotinic acid, and folic acid is synthesised microbiologically in the digestive tract of calves.[47]

Riboflavin Research

One of the most important contributions recently made to the study of riboflavin is the announcement that flavin-adenine-dinucleotide has been synthesised and shown to give full enzyme activity when combined with the natural apo-enzyme.[48] A method of isolating the pure coenzyme from animal tissues and yeast has also been described.[49]

Riboflavin deficiency reduced the survival time of rats subjected to cold[50] and also reduced the D-amino acid oxidase activity of rat liver.[51] Rat liver contains an enzyme capable of converting riboflavin into a glucoside, apparently by catalysing the transfer of a molecule of glucose from maltose or glycogen.[52] A simple synthesis of riboflavin-5-phosphoric acid has been described,[53] in which riboflavin is reacted with metaphosphoric acid.

Interest in antagonists to ribo-

flavin continues to be displayed by workers in various parts of the world. Diethylriboflavin has been shown to inhibit the growth of tumours, and yet replace riboflavin as a growth factor for *Bacillus lactis acidi*.[54] Other riboflavin antagonists have tumour-inhibiting properties.[55] An enzyme for which the name flavokinase has been proposed has been shown to be present in brewers' yeast.[56] It brings about not only the phosphorylation of riboflavin but also that of the closely related analogues, araboflavin and dichloroflavin; lumiflavin inhibited the phosphorylation of riboflavin.

When lyxoflavin was first described it appeared probable that its activity might be due to its close relationship to riboflavin, but it now appears that the two substances possess independent growth-promoting activities. Thus with *L. lactis* there was no evidence of competitive inhibition with riboflavin, whereas with *L. casei* competitive inhibition was observed in one medium, and potentiation in another medium.[57] Lyxoflavin stimulated the growth of young pigs maintained on a synthetic diet, and there was apparently no conversion of riboflavin into lyxoflavin.[58] Young pigs require about 2 mg. of riboflavin per kg. of dry feed, and young calves about 1 mg. per kg.[59]

Tryptophan as Anti-pellagra Vitamin

Tryptophan was as effective as nicotinic acid in pellagrous glossitis,[60] but in monkeys it was much less efficient than nicotinic acid in preventing symptoms of nicotinic acid deficiency.[61] In the rat, however, equimolar quantities of tryptophan and nicotinic acid were equally effective as precursors of pyridine nucleotides, although tryptophan was the less effective in promoting growth.[62] The injection of tryptophan into eggs after 10 days of incubation resulted in a significant increase in the nicotinic acid content.[63] Ten g. of DL-tryptophan produced the same increase as 1 g. of nicotinic acid in the pyridine nucleotide content of human red blood cells.[64]

Attempts are still being made to determine how tryptophan is converted into nicotinic acid. Both 3-hydroxy- and 3:4-dihydroxyanthranilic acid are converted by liver preparations into quinolinic acid and nicotinic acid,[65] and although quinolinic acid appears to be a precursor of nicotinic acid, the small increase in the excretion of nicotinic acid metabolites that follows the administration of quinolinic acid does not entirely account for the increased excretion of these metabolites following tryptophan administration.[66] Results obtained with tryptophan containing deuterium and N^{15} confirm the conversion of tryptophan into quinolinic acid and indicate that the nitrogen of the indole ring of tryptophan is incorporated into the disrupted benzene ring to form the pyridine ring of quinolinic acid.[67]

New figures have been published for the nicotinic acid content of fruits, vegetables, and nuts.[68] Apples contain 50 to 90, gooseberries and blackcurrants about 260, and tomatoes 520 μg per 100 g. Of the vegetables examined legumes contained most, broad beans containing 4·25 mg. per 100 g.; onions contained 175, potatoes 400 to 500, and kale, parsnip, and asparagus 1,000 μg per 100 g. Nuts contained 200 to 1,600 μg per 100 g.

Pyridoxine as Biochemical Catalyst

Results published during the year emphasise the importance of pyridoxine as a catalyst for numerous metabolic reactions. It has now been demonstrated, for example, that pyridoxal phosphate catalyses the formation of cysteine from serine and homocysteine[69] and acts as a coenzyme of histaminase[70] as well as playing the more familiar role of bringing about the transamination and deamination of amino acids.[71] Although pyridoxine appears to be concerned in the conversion of tryptophan into pyridine nucleotides, it does not appear to influence the synthesis of the ribose portion of the pyridine nucleotides or its attachment to the nicotinic acid molecule.[72]

Pyridoxine-deficient rats, like riboflavin-deficient rats, appear to exhibit an increased sensitivity to cold.[73] Pyridoxine deficiency in the rat involves a reduction in the fat content of the body and the liver, but this can be remedied by increasing the fat content of the diet;[74] a deficiency of pyridoxine appears to impair the ability of the rat to synthesise fat from carbohydrate. Seborrheic dermatitis in man appears to be a local defect of the fat metabolism involving pyridoxine.[75]

Methods for the preparation of various phosphates of pyridoxal and pyridoxamine have been described,[76] and the structure previously assigned to pyridoxal phosphate has been confirmed by a study of its absorption spectrum and those of related compounds.[77] The spectra of pyridoxine, pyridoxamine, and pyridoxal undergo considerable changes with changes in *p*H, and the existence of different ionic species can thereby be demonstrated.

Pantothenic Acid and Coenzyme A

Interest in pantothenic acid has been concentrated almost entirely on its relationship to coenzyme A and the so-called *Lactobacillus bulgaricus* factor (LBF). It has been known for some time that the latter exists in several forms, and it has now been shown that pantetheine can react with different thiols to give, on oxidation, mixed disulphides which stimulate the growth of *Lactobacilli*.[78] These compounds were all transformed into the same active compound when treated with an excess of a given thiol, followed by oxidation with iodine. It is believed, therefore, that the various forms of LBF are simply mixed disulphides of pantetheine (N-pantothenoyl-2-mercapto-ethylamine) with various unidentified thiols.[78]

(To be continued)

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Avoiding Swells in Sausage Packs

THE role of anaerobic bacterial spores in natural sausage casings in the development of swells in canned sausage is the subject of a thesis by Fahriye Ogus of the Hanover Veterinary High School (*Die Fleischwirtschaft*, Sept., 1952, p. 227).

It seems that the heating of the cans at 100°C. for three hours cannot be certain to kill off the spores of all the organisms, the most resistant of which are *B. phlegmones emphysematosae*, *B. putrificus verrucosus*, and the bacilli of the mesentericus-subtilis group. On the other hand, a processing temperature of 120°C. for two minutes can be relied upon to destroy the spores of all the obligate and facultative anaerobic organisms that were the subject of investigation.

Mere soaking of the skins in disinfectants was inadequate for complete prior destruction of the adherent micro-organisms, although reasonable control could be achieved with certain new types of disinfectants, *e.g.* Tego G. and Tego M.

Dealing with the question of the treatment of the skins before filling with the sausage mix, the investigation indicates that soaking of the faeces-free skins should not proceed for a period exceeding one day before the final processing and preferably at temperatures not exceeding 15°C. The storage temperature of the sealed packs is also an important factor in the suppression of development of any spores that might have survived heat treatment. For short period storage a maximum temperature of 15°C. is recommended, and for longer periods 10°C. or lower.

From the data of this investigation it is clear that irreproachable fillings are no guarantee of freedom from subsequent gas swells if the casings are still contaminated with anaerobic organisms and the processing conditions are not sufficiently drastic.

Shell-fish for Human Consumption

Elliot B. Dewberry, M.B.E., F.R.San.I., F.R.I.P.H. & H.

Part II

In Part I of this series, the author described the historical background of shell-fish. In this final part, bacteriological standards and descriptions of purification processes for oysters and cockles are given.

FOR many years the Fishmongers Company have carried out systematic bacteriological examinations of shell-fish and allowed about 100 coliform organisms per oyster on 40 per cent. of the samples examined.

The raw cockles are discharged from the boat.

Bacteriological Standards

Clegg and Sherwood (1948),[10] suggested a more satisfactory bacteriological standard. They measured the degree of contamination of faecal coli in a single test which does not require confirmation. Roll-tubes of a modified MacConkey agar are inoculated with material from the shell-fish and incubated at 44°C., a temperature which inhibits the growth of non-faecal coli. If four out of five samples of shell-fish from the same source are free from coli in 1 ml. quantities of tissue such shell-fish are said to be fit for food. If there are two or three faecal coli per ml. of shell-fish in any sample, further investigation is necessary.

In the Fishmongers' Company memorandum (Knott, 1951),[11] three methods for the examination of oysters and other shell-fish are reviewed, *viz.*: short method (Klein and Eyre); long method Houston-Eyre); and the combined roll-tube and percentage method (based on that of Clegg and Sherwood). As a result of experiments so far completed, it is suggested that a *Bact. coli* count standard and the Company's "percentage clean" standard will correspond approximately as follows:

Percentage clean	*Bact. coli (Faecal type 1) per ml. of flesh*	*Conclusion*
	Colonies	
100 to 80 ..	5	Quite satisfactory.
70 ..	5-15	Suspicious. Further samples to be taken. Sale not immediately prohibited.
60 and lower	above 15	Unsatisfactory. Sale prohibited until further samples examined.

Equipment for the purification of cockles. Washing tanks in the foreground, sifting tank on the right, and three cooking pots in the background.

A Modified Cleansing Process

Peirson (1952)[12] has pointed out that there is still a strong prejudice against the use of chlorine and many allegations that the oysters are adversely affected both by the chlorine and by the warming of the water in winter. There is no evidence, however, that these

objections are justified. A simple and safe alternative method of purification which could be carried out locally would certainly have its advantages.

Cole (1951)[1] remarks on this as follows: "There is an urgent need for the provision of a simple, cheap, and reliable method of purification for use on oyster fisheries where, although the risk of sewage contamination of oysters is small, it cannot be completely eliminated. This may be said to be the general condition of the majority of British beds not already closed on public health grounds. Sewage is present in many estuaries, but is usually discharged many miles from the nearest beds, and is greatly diluted. Public Health authorities are naturally reluctant to give a 'clean bill' to such fisheries, and the provision of some extra safeguard in the form of a simple method of treatment would materially assist sales. Such a process must be cheap to run and low in capital cost, and experience with systems involving chlorination of water suggests that prejudice against them will not be easily overcome and that some other method is required.

"There is a good deal of evidence for the view that such slight pollution may be readily eliminated by the proper use of efficient storage pits, excavated on the shore out of reach of the tide, to a depth of about 2 feet 6 inches, and filled by pumps at high water. Oysters retained in such pits for four days have been found to get rid of all contamination even at temperatures as low as 5°C. By siting the pits as far away from actual sewer outlets as is reasonably practicable, and by filling only at high water, re-contamination with sewage organisms may be avoided. Using a series of such pits, in regular sequence, successive batches of oysters may be prepared for market.

"Under such conditions, oysters remain healthy almost indefinitely during cool weather; the water may be changed weekly if desired, but a further two days should be allowed to elapse after renewal before any oysters are removed for market. The suggested period of cleansing—four days—appears to offer a sufficient margin of safety even during the coldest weather when the rate of filtration of water by the oysters is reduced to a minimum."

Equipment at Oyster Fisheries

During 1951, a modified inexpensive experimental purification plant was installed at the Yealm Fisheries near Plymouth. Up to this time all oysters from the river Yealm were subjected to the full purification process approved by the Ministry of Health. It was thought that if a controlled and simple purification process proved satisfactory from a bacteriological point of view, it would enable some of the oysters to be marketed locally.

The experimental plant which was to be used by the Yealm Oyster Fisheries, came under the supervision of Dr. T. Peirson, the Medical Officer of Health, Port of Plymouth, Devon. Three concrete tanks were constructed in the vicinity of the gathering beds, each approximately 3 feet in width and 4 feet deep and holding 300 gallons of sea-water with an outlet valve at the bottom of each for drawing off the water when required.

The tanks were provided with wooden covers arranged so that the air circulated freely over the surface of the water. The covers also prevented access of leaves and bird droppings. A wooden grid was fixed about 6 inches from the bottom of each of the tanks which were filled by pumping in sea water to within 9 inches of the tops. Pumping took place between one and half-an-hour before high water, that is while the tide was still running strongly. The end of the intake hose was kept clear of both the bottom and the surface of the water during pumping.

After being scrubbed and hosed down to remove mud and debris, the oysters were placed on the wooden grids in the tanks where they remained for four days without any change of the sea-water.

The purification process can be used during the winter months as it was not found necessary to heat the sea-water, the temperature of which ranges from 9·5°C. to 15·5°C.

The degree of pollution of the oysters before treatment was shown as follows:

Roll tube	*Faecal coli per ml. flesh* 20.4.51	26.4.51	2.5.51	16.5.51
a	4	6	4	2
b	4	2	0	0
c	2	4	0	4
d	0	4	0	6
e	0	0	2	4
f	2	16	30	2
g	2	0	42	0
h	2	4	14	8
i	4	0	18	0
j	2	2	28	2
Temperature range of water during experiment	9·5-13·5°C.,	10·6-12·8°C.,	10·0-11·7°C.	

After cleansing, samples of oysters bacteriologically examined showed faecal *B. coli* absent in 1 ml. of flesh after two and four days after treatment.

At the conclusion of the experiments it was decided to allow oysters which had been subjected to this modified simple purification to be marketed, provided the bacteriological examination of each batch proved satisfactory.

Purification of Cockles

The cockles on arrival from the gathering grounds are first washed in sea-water and then in clean tap water to remove the mud and sand. They are cooked in pots provided with reducing valves and pressure gauges, etc., in accordance with the regulations, *viz.*: "A process of sterilisation by steam under pressure for at least six minutes in an apparatus which is for the time being approved by the said Port Health Authority."

After cooking, the shell-fish are emptied on to a rectangular riddle suspended from the roof of the building over a 30 gallon tank of fresh water. The riddle is worked backwards and forwards so that the shells are separated from the fish, which fall into the water, the shells and sand sinking to the bottom of the tank. The fish are afterwards transferred to a series of tanks containing clean tap water and stirred round in a circular motion by means of a net attached to a short handle. This process facilitates cooling and the removal of debris. The cockles are finally brought to the surface

of the water and any broken fragments of shell picked out by hand. The cleaned fish are then salted.

Those requiring to be sent to distant markets are stored temporarily in concrete tanks containing strong brine. This treatment necessitates their being soaked again in clean water before becoming suitable for consumption. Cockles sold locally are only slightly salted to bring out the flavour of the flesh. They are then placed in muslin bags and packed in wicker hampers ready for transportation by rail or road.

Regarding the purification process, Pilsworth (1952)[6] is of the opinion that cooked shell-fish present bacteriological problems peculiar to themselves and differ from shell-fish normally eaten uncooked in the methods by which they should be examined. The steaming process appears to destroy all non-sporing organisms derived from sea-water.

The process of riddling does not appear to release organisms that have been protected by dried mud from the action of the steam, because no such protection can be demonstrated.

During the washing process a considerable degree of contamination appears to take place, mainly from human sources. Although the bacterial population may increase while shell-fish are held by the retailer, this is probably more a function of time and temperature rather than of contamination derived from the retailer. Ample opportunities for contamination do, however, occur in many retail concerns.

Future of the Cockle Industry

With regard to the future policy of the commercial cockle industry, it has been suggested by Drake (1952),[13] that experiments should be carried out in order to develop a two-stage cooking process for cockles. The first cooking to release the flesh from the shell and the second to pasteurise the flesh after it has passed through all the washing and brining stages, where a good deal of handling and possible contamination of the flesh may occur. It would then be reasonably assured that such a process would ensure safe cockles being placed on the market. Any further precautions to prevent contamination of the shell-fish would have to be taken by the retailers, who have considerable responsibility for the safety of the product.

After cooking and cooling, the cleansed cockles are then salted to bring out the flavour of the flesh.

It might be mentioned that a limited trade is carried on with pickled cockles. The fish are salted, placed in jars in vinegar, and then sealed. These keep in good condition for two or three weeks.

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The three photographs illustrating this article are published by courtesy of Mr. Reginald A. Drake.

Animal By-products from Poland

THE steadily and substantially increasing livestock population in Poland constitutes an important foundation for the meat industry in general and for the slaughterhouse by-products industry in particular. This industry deals not only with hog casings and animal glands, hides, bristles, horns, hoofs, blood, and fats, but also with such other by-products as gall, backbone, marrow, pig and calf maws, intestines, and the like.

Immediately after trimming, the glands are chilled for approximately 30 minutes and are then frozen at a temperature of −18° C. All these operations are carried out on the slaughterhouse premises. The frozen glands are cold-stored at temperatures ranging from −15° to −20° C.

The different animal glands required by the pharmaceutical industry are exported by Poland in the frozen state.

Hog casings are another important item in Polish exports of slaughterhouse by-products. Separate standard specifications apply to casings allocated for export; their rigorous implementation and close examination of the finished product make it possible to maintain a high quality standard.

Hog casings are collected from slaughterhouses in perfect hygienic conditions, under close veterinary supervision. They are carefully examined during the grading process, any part of the casing showing any defect being severed and rejected.

After the length of individual sections has been carefully determined, the casings are tied in bundles of 90 metres each. No bundle may contain more than 15 pieces, and the shortest of these must be not less than two metres.

The casings are preserved in brine for a period of 14 days, after which they are removed, strained, and dry-salted. They are then packed in layers, in standard casks holding 100 bundles each, with salt in between the layers and on the bottom of the cask.

Prior to export, the casings are examined by officers of the Standards Inspectorate.

Transport and the Food Industry

Part III

Graham Saville

In this instalment is discussed the involved system applying to railway goods charges and the close attention required in the preparation of the contracts entered into between the trader and the railway, upon which the charges depend.

THE contract is the consignment note which has to be handed by the trader to the railway when traffic is forwarded by railway goods service.

It is laid down in the Standard Terms and Conditions of Carriage that the consignment note prepared by the trader must contain certain information. Much of this information is obvious, but even with such details care must be exercised. For example, in giving the consignee's name and address a full description is essential. The address must be so shown as to enable the railway to determine the address and point to which the goods require to be forwarded. There are a number of towns and villages of the same or similar names, and unless sufficient information is given, delays and even loss are likely to occur.

Classification of Goods

A scrutiny of the General Classification of Merchandise will show that the same commodity packed in various ways can fall into different classes. This will be seen with jam or marmalade which, when packed in tins and forwarded in lots of less than two tons, will take Class 15 but, if packed in glass jars or bottles and forwarded in consignments of less than two tons, is covered by Class 16.

Again it cannot be too strongly stressed that a full description of the merchandise is essential as otherwise the railway have no alternative but to make a charge at the highest classification applicable. For example, if jam or marmalade were merely consigned as such, the classification would probably be applied as Class 19. This would mean much higher charges being paid.

A commodity may apparently be listed under various headings with wide variations in classifications. An example of this is with preserves which include vegetables in hermetically sealed tins, in casks, cases, or crates. The classification for two ton lots is 14, and for less than two ton lots is 15. Under another heading, however, it will be found that canned vegetables are actually in Class 12. This is under the heading of "Vegetables in Class 14 or lower Classes in tins packed."

Payment of Charges

Another of the features in the preparation of the consignment note concerns the payment of charges. At the present time the majority of consignments have to be forwarded "carriage paid," although the Railway Executive have recently permitted some relaxation from this regulation. They are now prepared to accept traffic with the charges paid by some third person, subject to the arrangement having the prior consent of the railway and also to the other party having a ledger account with the Railway Executive.

Even when traffic is consigned "carriage paid," there are different methods of doing this. If the sender is only anxious to be responsible for the carriage charges up to the destination station, the consignment note should be endorsed "carriage paid to station only."

If he is anxious to be responsible for the cartage at the destination station within the railway's free limits but not willing to accept responsibility for any out-boundary cartage charges, the consignment note should be marked "carriage paid" or "carriage paid within free limits only."

On the other hand, if the sender wishes to make himself responsible for the whole of the cartage charges, including any out of boundary cartage, the consignment note should read "carriage paid home" or "carriage paid to destination."

As in many instances railway documents will not be available at the time goods are being delivered, it is advisable that the labels should read in the same way as the consignment note.

One of the principal methods of achieving economy with rail charges is for items for the same destination to be grouped together. This can be done merely by endorsing the consignment note "part lot where applicable."

Again, with some traffic the trader has the alternative of consigning at company's risk or owner's risk. Where such applies and the trader is anxious that the goods should be forwarded at owner's risk, the consignment note should be endorsed to this effect. It will be realised that by consigning at owner's risk certain percentage reductions are allowed.

If the sender endorses the consignment note at owner's risk and there are no such rates applicable to the traffic concerned, the merchandise will be carried under the railway company's risk terms and company's risk rates will apply. It will be found that if attention is paid to these various points when preparing a consignment note, the possibility of loss or damage occurring is greatly reduced.

Some food concerns will be anxious to obtain receipts for the goods handed by them to the railway. They have a right to such receipts but they must be prepared by the trader and cannot be used as evidence of the declared nature of the goods.

Labelling of Goods

The railways have laid down various regulations for labelling of traffic forwarded by railway goods service. These regulations

state that each article or package must bear the consignee's full name and address in legible and durable characters. There are, however, various concessions, and when a consignment consists of 11 to 100 packages, it is only necessary to label one in five with a minimum of 10 packages, although the remainder of the packages must bear the consignee's name and destination station.

If a consignment consists of over 100 packages, one in every 10 with a minimum of 20 must be fully labelled. Again, the remainder must be marked in legible and durable characters with the consignee's name and destination station. It is also laid down that the packages fully labelled must show the total number of packages forming the consignment, and in circumstances where this is not possible all the packages must be fully labelled.

With the special equipment which is now available for the simultaneous preparation of many documents, some food manufacturers will find it advantageous to label all packages fully.

Where traffic is being forwarded in full truck loads, these regulations do not apply. In such cases it is normally sufficient to label a few packages to enable the consignment to be identified.

Many food manufacturers operate their own private sidings and should be aware of some of the special provisions applying to traffic forwarded direct from such sidings. It is laid down that unless it has otherwise been agreed with the Railway Executive, either generally or in respect of a particular consignment, each truck must be labelled with two labels securely fastened one on each side of the wagon. The labels must give the following details:

1. The name of the sender.
2. The name of the consignee (except where the truck is loaded with merchandise for more than one consignee).
3. The station or place of destination.
4. The nature of the merchandise.
5. The actual weight, or where this is not practicable, the approximate weight of the merchandise (inclusive of packing).
6. The name of the owner and number of the truck.

(*Concluded at foot of next columns*)

The Viscosity of Sugar Solutions

NEW determinations are reported by H. Roederer, of the Research Department of Deutsche Maizena Works, Hamburg, for the absolute viscosities of aqueous solutions of sucrose, starch syrup (43·64 per cent. dextrose equivalent in dry substance), and a higher molecular starch syrup fraction. Some of the viscosity data, obtained at 20°C., are presented in the Table.

The higher molecular fraction was isolated by subjecting a solution of starch syrup in water to fractional precipitation with a very large volume of methanol, a product which is not hygroscopic at room temperature. At 30°C. and 80 per cent. relative humidity equilibrium was rapidly established with uptake of 10 per cent. water.

Starch syrup solutions of a given concentration (calculated on the commercial basis) are only a little less viscous than the corresponding sucrose solutions. Thus, in order to obtain a viscosity of 1·7 centipoises at 20°C. a solution must contain either 19·7 g. sucrose or 19·0 g. starch syrup (commercial basis) per 100 ml. For manufacturing purposes, however, the relative sweetening power is a complicating factor. Assuming the sweetness of starch syrup to be 50 per cent. of that of sucrose, liqueurs must contain 100 g. starch syrup per litre to achieve the same sweetness as 50 g. sucrose per litre, so that the viscosity of the product made up with starch syrup is considerably higher.

Boiled sweets with a water content round 2 per cent. may consist of a solidified melt of sucrose, glucose, and a little invert sugar. The higher molecular components of starch syrup considerably increase the viscosity of the melt and prevent or hinder crystallisation of the sucrose. In this connexion it is necessary to correct the widespread belief that the sticking of hard caramels is due mainly to the dextrin-like constituents of starch syrup. If this were true a syrup with a high content of high molecular substances would strongly promote the sticking of sweets, whereas at the other extreme with a highly degraded starch syrup there would be very little sticking trouble. In practice, the opposite is the case, and the high molecular substances isolated from starch syrup are likewise free from hygroscopicity and stickiness.

	Concentration		*Density*	*Viscosity in*
	Comm. basis g./100 ml.	*Dry substance g./100 ml.*	*20°/20°*	*Centipoises*
Starch syrup ..	5	16·57	1·064	1·762
	20	8·35	1·032	1·280
	10	4·02	1·015	1·132
Higher molec. starch syrup fraction (dextrin)		20·00	1·073	2·280
		12·15	1·044	1·610
		4·92	1·017	1·183
Sucrose ..		20·00	1·077	1·717
		10·00	1·037	1·245
		5·00	1·018	1·090

Special Traffic

Brief mention should perhaps be made to some of the concessions which can be obtained for special traffics.

Details of the types of traffic involved will be found in the "Special Instructions Relating to Goods, Mineral and Livestock Traffic." This book is normally known as the "pink pamphlet."

The concessions apply to such traffics as those returned for various reasons, and the allowance with items of this character is half the carriage charges in respect of the return journey. The goods can be those wrongly sent by the consignor and returned, articles found not to be of the quality ordered and returned, and articles returned from warehouse or showrooms at the end of the season. There are similar concessions in respect of traffic sent for repair and also items which have been damaged.

(*To be continued*)

News from the Industry

FORTHCOMING EVENTS

Royal Society of Arts

On April 15, Mr. L. Landon Goodman of the British Electrical Development Association will read a paper on "Materials Handling and Processing."

The Chemical Society

Prof. H. S. Taylor will give a lecture on "The Scientific Problems of Surface Catalysis" on April 30 at 7.30 p.m.

Society of Chemical Industry

The Microbiology Group of the Society of Chemical Industry has arranged the following meeting for April:

Apr. 16. "The Use of the Bacteriophage in the Study of Viruses," by Dr. Lois Dickinson, and "Bacteriophages of the Lactic Streptococci," by Mr. L. J. Meanwell. To be held at 6.15 p.m. at the Medical Society of London.

The April meetings of the Agriculture Group are as follows:

Apr. 20. "Organic Fungicides," by Mr. G. G. Taylor. The Crop Protection Panel annual general meeting, to be held at 5.30 p.m. at the Chemical Society.

Apr. 21. "Estimating the Water Requirements of Plants," by Dr. H. L. Penman. To be held at 2.30 p.m. at the Chemistry Lecture Theatre, Royal College of Science.

The Food Group Section has arranged the following meetings for April:

Apr. 8. Annual general meeting.

Apr. 22. "Food and the Future. 4. Synthetic Food Potentialities," by Dr. W. F. J. Cuthbertson. Nutritional Panel annual general meeting.

Apr. 28. Joint meeting with the Royal Sanitary Institute at Hastings.

Mobile Laboratory for Lollie Syrups

A mobile laboratory has been fitted out by Lautier Fils for making up samples of their extensive range of lollie syrups at the customer's door. The advantage of testing the finished products "on the spot" is obvious, and the fact that the demonstrations will be given by a qualified chemist who may be consulted for any technical problems relating to the manufacture of ice cream or lollies will, undoubtedly, make an important contribution towards solving some of the many technical difficulties confronting the trade today.

The company have recently introduced a range of pasteurised six-fold lollie syrups, having a natural fruit base and containing added vitamin C; these will be sold under their brand name of Vitapop.

Food Group's Twenty-first Birthday

DINNER-DANCE CELEBRATIONS

A record number of members and their ladies attended the twenty-first birthday celebrations of the Food Group of the Society of Chemical Industry at the Dorchester Hotel on March 7.

After an excellent dinner had been enjoyed and the loyal toast honoured, the toast of the Food Group was proposed by Dr. L. H. Lampitt, who traced the history of the Group from the time of its inception to the present day. The toast was responded to by the chairman, Prof. H. D. Kay, who, after paying tribute to the services of Dr. Lampitt to the Group over the years, presented him with an ash tray. A similar memento was presented to Mr. L. H. G. Barton as a token of his excellent organisation of the Birthday celebrations. These ash trays, said Prof. Kay, were made from pieces of the beam from an old barn in the grounds of the National Institute for Research in Dairying at Shinfield. Tradition had it that the beam had been made from the timber of one of the Elizabethan warships.

Prof. and Mrs. H. D. Kay received the guests.

In view of the fact that he had broken several pipes on the Committee table during his years of office, Prof. Kay presented the chairman-elect, Dr. J. H. Bushill, with a gavel and striking board reputed to be made from the same historic material.

The health of the guests, coupled with the name of Dr. L. A. Jordan, chairman of the Council of the Society of Chemical Industry, was proposed by Mr. A. L. Bacharach in his usual felicitous style, and was responded to by Dr. Jordan.

A pleasant interlude ensued when Mrs. Kay received the Birthday Cake presented to the Group by Mr. R. D. Mason. After cutting it, Mrs. Kay made a graceful little speech of thanks. The dinner tables having been cleared away, the spacious dance floor was soon filled with dancers young and old. During the tea interval, there was a general interchange among the occupants of the tables when old acquaintances were renewed and new ones made.

B.B.I.R.A. Research

As a result of experiments (reported in a recent Bulletin) on the effect of treatment and hardness of water on breadmaking, the British Baking Industries Research Association state that they have found no significant differences in breadmaking quality between the waters used, even at the extremes of variations likely to be encountered in Great Britain, and that no normal water treatment, as at present used, whether public or private, will have any effect, good or bad, on the breadmaking process.

Included in the same Bulletin is important information on the presence of extraneous matter in bakers' products in which dried fruit is used. Apart from the valuable help which the Association has given to individual members threatened with prosecution for infestation over which they cannot possibly exercise control, it has been possible to discuss the problem with the Scientific Adviser's Division of the Ministry of Food with results which will be of advantage to the whole industry.

The work of the Research Association has expanded considerably in the past year or two, with the result that the Council has felt the need to appoint a Research Superintendent to remove some of the load from the Director's shoulders. Dr. D. W. E. Axford, who has been appointed, assumed his duties at the beginning of March on leaving his present post of Physical Chemist at Courtaulds Fundamental Research Laboratories at Maidenhead. Dr. Axford is a graduate and Doctor of Philosophy of Cambridge University and also spent a year in the U.S.A. carrying out physical research at the Pennsylvania State College. He is a member of the Faraday Society and a Fellow of the Chemical Society.

The 18 numbered containers, holding samples drawn at known regular intervals, provide an accurate record of production.

An Automatic Sampler

A new and important addition to their range of quality control instruments for the food laboratory, known as the Mercier automatic sampler, has just been announced by Henry Simon Ltd. Devised to overcome the drawbacks and uncertainties of existing methods of sampling, the instrument is entirely automatic in operation. It was originally designed for use in flour mills, but there is no doubt of its usefulness in all processes involving granular products. It is intended to be fixed into a spout carrying a flow of stock and to draw from the flow samples of specific size at predetermined regular intervals; the samples are retained in the steel cabinet in which the sampler is housed. The cabinet can be locked, and since the key will normally be held by the manager or chemist the whole sampling process is placed under the direct control of the man responsible for maintaining quality.

Essentially the sampler consists of two self-contained units, the timer and the sampler. The timer may be set to operate the sampler unit at intervals of 30 minutes or one hour, and incorporates means to ensure that the sample is of adequate size. It is housed in a dustproof cast aluminium case, arranged so that it may be mounted on a bracket inside the sampler cabinet where it cannot be operated by unauthorised persons.

The sampler unit, which can be fitted easily into any stock spout, comprises a short spout connexion with a sample scoop and discharge port, a turntable carrying 18 sample containers, and a single solenoid which, when energised by the timer, moves the links which perform the sampling operation. At the intervals determined by the setting of the timer unit, the solenoid is energised and causes the sampling scoop to move into the stream of stock, at the same time rotating the turntable to bring an empty container into conjunction with the discharge port attached to the spout connexion.

When the electric circuit to the solenoid is broken after a sample has been taken, the return mechanism withdraws the scoop from the stream of stock to a position where its contents are fed through the discharge port into the waiting container. A dust seal closes the gap between the discharge port and the container, thus ensuring that no dust escapes during the discharge operation.

The 18 containers in the turntable are numbered, and the instrument thus enables a complete record to be kept of the material produced during any period, including the night shift, when the manager or laboratory staff may be away from the plant.

The Chickchilla

A new refrigerating unit, the "Chickchilla," made by Frigidaire, has been introduced for use by the poultry packing industry. It takes up to 48 birds after plucking and reduces their temperature from blood heat to air temperature in one hour, thus speeding up the stages between plucking and quick freezing or cold storage. A larger size takes up to 95 plucked birds.

The trough of the freezer is so arranged that the vent of the bird and the intestines get the full impact of the freezing, thus helping to eliminate "greening" in storage.

OBITUARY

Mr. H. B. Fergusson, senior director of G. A. Harvey on February 20.

Mr. Fergusson joined the company in 1933 as manager of the heavy construction department and was very largely responsible for the growth and development of their activities in the oil, chemical, and heavy engineering industries. He was appointed to the Board of Directors in 1938.

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Mr. Stewart Percy Dormer, managing director of Bovril and a Fellow of the Grocers Institute, on February 12, at the age of 51.

Mr. Dormer had recently completed 30 years' service with Bovril, of which company he was elected a director in 1941 and managing director in 1946. He was a director of a number of other companies including the Argentine Estates of Bovril, Forsters Glass Co., Marmite Food Extract Co., and the Wallis Tin Stamping Co.

He was a well-known breeder of dairy cattle and had been successful with his Park End herd of Guernseys.

Saving Peak Load Electricity

An idea has been developed by The General Electric Co. to enable electricity to be utilised for space heating purposes without affecting the demand for electricity at peak periods. For some years past it has been the practice on the Continent to use, for reasons of economy, a small fire to heat a mass of brick work which is allowed to give out its stored heat to the surrounding air and thus provide background heating over a long period. By the use of concrete and a small, specially designed electric element mounted in a simple sheet steel case of attractive appearance, the G.E.C. has obtained the same effect. These electric thermal storage radiators are designed for use on a time-switch-controlled circuit so arranged that the radiators draw their power during the night, when power stations are not troubled by a peak demand for electricity, and convert this current into heat for the following day's heating.

These thermal storage heaters have a maximum charging period of eight hours. Their heat output expressed as a percentage over 24 hours is 35 per cent. during the eight hour charging period, 56 per cent. during the day, and the remaining 9 per cent. in the last eight hours. The heat emitted during the charging period provides a comfortable room temperature at the start of the day.

Aluminium Stacking Container

A new aluminium stacking container, 2,600 cu. in. capacity, is being produced by Warwick Production Co.

This container has been produced in response to general demand, and in particular for the meat, fish, canning, and other food trades where a high degree of hygiene is essential.

It is a heavy gauge one-piece pressing of high strength aluminium alloy in which crevices and corners are virtually eliminated, and in which there are no rivets or welds to fail and/or collect foreign matter.

The strong rim obviates handles and positive stacking is ensured by an extra deep swage; it is available with or without base drainage holes.

A self-sealing gusset bag for wrapped pork pies.

Bags for Pork Pies

When marketing their wrapped pork pies, Keen's of Watford found that they were up against the time factor since the newly cooked pies had to be in their vans and away to their depots in a matter of hours. The solution was the use of a specially designed Seal-Easi gusset bag made by John Dickinson and Co.

The bags are opened by means of an air jet and the pies dropped into them down a chute. The operator turns over the flaps, thereby neatly sealing the pies in the bags.

The special latex adhesive appears on the flap (A) and on the body (B) of the bag so that when the two are brought into contact, the bag is held firmly and neatly closed.

Applications of Solenoids

A wide range of solenoids is manufactured by Westool Ltd. These have countless applications in industry, ranging from the opening and closing of doors and valves to the sealing of food cartons. Advice on the use of solenoids is always available from the company who have facilities for designing special types where standard models are not suitable.

The company also manufacture high frequency vibrating equipment which is used for the consolidation and packing of granular substances, transporting small objects, and de-aeration.

Flood Damage to Sausage Casings

All customers of the Oppenheimer Casing Co. (U.K.) in the flooded areas are informed that the company will recondition all damaged stocks of Oceco Brand sausage casings.

The Head Office at 159-165, Harrow Road, London, W.2, will arrange special credit facilities.

Steam Raisers

Two Autolec steam raisers, a 30 kW and a 70 kW model, were exhibited by G.W.B. Electric Furnaces, together with a flow diagram illustrating the application of an electrode water boiler to a thermal storage system at the recent Factory Equipment Exhibition.

All the usual safety devices are incorporated and include a protection against a "burn-out" owing to a shortage of water in the boiler shell. Any absence of water will immediately and automatically break the electrical circuit.

The uses to which this equipment can be put include tanning, pressure vessel testing, sterilising, bottle washing, ice cream manufacture, pasteurising, space heating, food production, laundry work, plastic moulding, and many other industrial processes where a supply of steam is necessary.

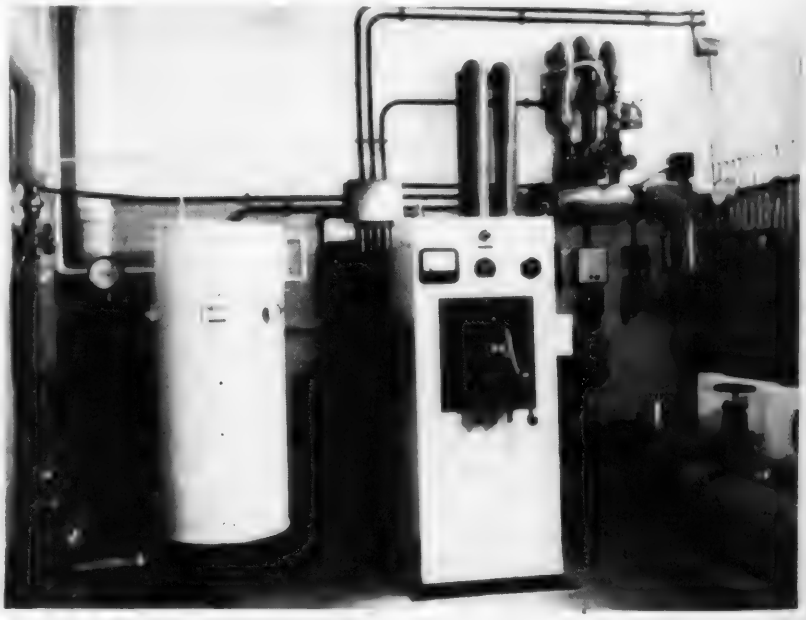
Further advantages include entirely automatic control, the absence of ash, fuel dumps, flues, and chimneys. No boilerhouse is required as the steam raiser can be placed in virtually any position often adjacent to the equipment actually using the steam.

The Autolec thermal storage system combines all the advantages of the electrode water boiler with that of enabling the system to be run on a night load, often at a reduced electricity rate.

Recorders on Show

Exhibits to be shown by Evershed and Vignoles at the Physical Society Exhibition include a new Megger insulation tester in which the generator has been replaced by a static rectifier operating from A.C. mains in conjunction with a step-up transformer. The instrument has three testing voltages, namely 1,000, 2,500 and 5,000 volts, and six megohm ranges, the highest being 100,000 megohms.

Other exhibits will include a quick response recorder (high sensitivity type), a high response recorder, a miniature recorder, Servo and F.H.P. motors, and the new Evershed-Straub degassing condenser. This latter apparatus removes gases such as ammonia, carbon dioxide, and hydrogen sulphide from samples of condensed steam so that gas-free samples may be tested for conductivity determination by the Dionic water purity meter.



A 200 kW Autolec thermal storage installation.

Conveyor Line for Cake Production

KEEPING PACE WITH CAPACITY OF AUTOMATIC OVENS

A Lancashire bakery recently applied method study to its confectionery department, in an effort to speed up operations to cope with the high productive capacity of the automatic ovens (*Target*, 6, 1, 1953).

Following a study of the sequence of operations in the manufacture of Eccles cakes, a new layout, based on conveyors, was introduced. One problem was to find a way of delivering the minced fruit in a form in which it could be readily applied to the squares of dough.

The solution was found in a device resembling a sausage machine into which the fruit is fed, extruded in compact form, and then cut into equal portions. These can be placed in the centre of the dough and the corners brought together with fewer movements than in the old method, where the girls took the loose minced fruit from a bowl and had to estimate the amount required.

Small tin trays fitted to both sides of the band conveyor at intervals of 12 inches serve as pre-moulders for the cakes. The moulding of the cakes in wooden jigs is completed on the last section of the band. They are then transferred to baking trays, served into the ovens, then proceed through a cooling plant, and on to the prepacking band.

At the start of the packing line the cakes are stacked in threes for easy handling by the wrappers. Wrapping and heat sealing is done at the same station.

The continuous operation from the first handling of the raw materials to the despatch of the finished products is carried out in approximately half the space required by the earlier methods which involved the use of large tables, scores of trays, and frequent handling and carrying between points. Work flows to and from each operative in a job which has been shorn of all fetching and carrying so that human effort is fully productive.

The same streamline technique has been applied to the production of other cakes and confections with equally good results.

The bakery has been responsible for several mechanical and other developments which have become standard practice in the industry.

A recent idea, developed in conjunction with I.C.I. chemists, is a new plastic based on fluorine for covering rollers which come into contact with flour, dough, and other ingredients. When applied to metal surfaces, the compound gives a glass-smooth non-adhesive finish, improving the product and reducing waste.

Left: **Metal trays let into the conveyor facilitate pre-moulding of the pastry. The operative in the right foreground is placing portions of minced fruit on to squares of dough. Seated operatives bring the corners of the dough together in rough pre-moulding. Final moulding in wooden jigs is carried out by the operatives who can be seen standing in the background.**

Below: **Wrapping and heat sealing of packages is done at one point, the work being brought to and from the operatives by conveyor. Both packaging devices were developed by the company.**

Northern Sales Office Opened

A Northern Sales Office has been opened by Burnett and Rolfe as an extension to their head office and works at Rochester, Kent.

The new office will be at 32, Deansgate, Manchester, 3 (Telephone: Blackfriars 3851). It will be staffed initially by Mr. W. Waddington, B.Sc., and Mr. D. S. Chadwick, A.M.C.T., A.M.I.M.E., both of whom have recently joined the company.

Mr. Waddington has had considerable experience in all phases of brewery engineering, and Mr. Chadwick, as a qualified chemical engineer, will be responsible for chemical and other plant.

Metal Containers

Considerable progress has been made towards the completion of B.S. 1133 "Packaging Code." Two large sections have recently been issued and the B.S.I. has now published the revision of Section 10, Metal Containers. This means that 13 of the projected 20 sections are now available and two further sections are likely to be issued shortly.

The new publication has five subsections. The first gives details of the materials and the construction of tins and cans and describes basic types and closures; it also discusses decoration, testing, and filling and closing procedure. The second subsection describes materials and construction of metal drums and gives details of a wide range of types. The sub-section on metal crates, hampers, and trays describes five broad groups of containers.

For collapsible tubes there is information on materials, sizes, weights, decoration, packaging for transport, and filling. The sub-section on composite containers also discusses materials, types, and sizes.

The whole of the section is amply illustrated and there are definitions of many trade terms.

New Aid to Fishing

FISCHLUPE RIGHTS ACQUIRED BY U.K. FIRM

The sole rights, for the United Kingdom and Commonwealth countries, of the Elac Fischlupe fish-indicating sounder have been acquired by the Marconi International Marine Communication Co.

Developed by the German firm Electroacustic G.m.b.H., the Fischlupe is a new departure in echo-fishing, and several instruments have already been installed in British fishing vessels. It employs a basic principle similar to that of the echometer, sending out sound impulses and receiving them after reflection from the sea-bed and from intervening fish shoals.

Instead of presenting soundings on a paper record or by a light flash against a graduated scale, however, the Fischlupe employes a cathode-ray tube, similar to those used in radar and television. It does not "see" the fish as a camera would, but records their presence in the form of a horizontal light trace upon the face of the tube.

This light trace shows at a position corresponding on the scale to the depth at which the fish are lying; once the presence of fish beneath the vessel has been established, the Fischlupe can be "focused" upon a horizontal stratum of water 45 ft. in depth, ignoring the empty water above and below the shoal.

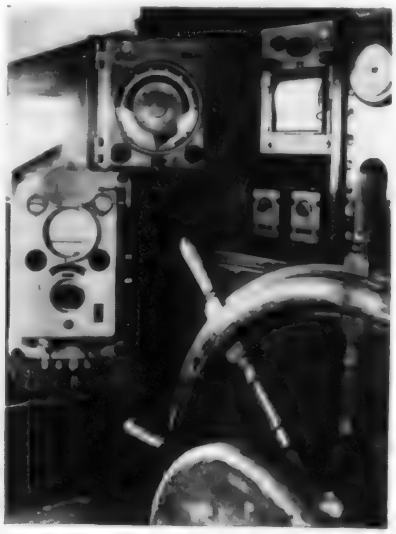
This magnifies the echo signals from the shoal to such an extent that a distinction can be made between the dense fine horizontal traces made by herring and the more widely spaced bolder traces attributable to larger fish, such as cod. When a 45 ft. layer of water is under observation, single traces from individual fish can be seen, and the density of the shoal accurately gauged.

With a little experience in interpreting the scan, the size of an impending haul can be estimated, as well as the direction of the centre of the shoal, where fish are usually thickest. By watching the screen, an experienced skipper can fish spirally inwards from the thin perimeter of a shoal towards the centre.

To operate, the main lift control is set to "survey" position and the equipment switched on. The face of the cathode-ray tube then shows a vertical line of light representing the full range of 300 fathoms, with horizontal deflections occurring at the depths representing the sea-bed and any intervening fish which may be present. Adjustment of the sensitivity control clarifies these deflections.

The main lift control is then rotated clockwise until the top of the horizontal deflection indicating the sea-bed is brought into line with a horizontal red mark on the tube face. When this is done the reading on the scale shows the true depth.

If fish are observed, the lift control knob is again turned clockwise, when the instrument becomes focused upon a 45 ft. vertical section of the sounding. The diameter of the tube face now represents 45 ft. instead of 300 fathoms as in the "survey" position, and fish indications which previously occupied only a small portion of the vertical line are distributed over the whole length of the line.



The Elac Fischlupe and Marconi Marine Seaviss and Seagraph echometers installed in a trawler's wheelhouse.

As the lift control is rotated further, the luminous echoes on the screen move upwards, almost giving the impression that the observer is in a diving bell, scanning the water through which he is descending. When the shoal indication is in position on the face of the tube, the exact depth, accurate to within a few inches, can be read from the scale below the screen, and if the shoal should rise or descend, its movements can be followed by adjustment of the lift control.

Tomato Grading

A smaller version of the Clyde Selector grading machine is now in process of development. It will handle some 80 baskets of tomatoes as against 240 baskets handled by the original model which was introduced last year.

It has two channels as compared with the six channels on the larger machine and is expected to cost about £110. The smaller output allows the one man to feed and also remove baskets after grading.

APPOINTMENTS

Mr. W. F. Norris has been appointed home sales manager of Peek, Frean and Co. in succession to the late Mr. Stanley Hughes.

Mr. Norris, who took up his new duties on February 9, has previously held the position of London area sales manager.

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Dr. S. M. Herschdoerfer has been appointed Wall's chief chemist in succession to Mr. George H. Searle.

Dr. Herschdoerfer completed his education at the University of Vienna. After working in Paris with the dairy combine, *Fermiers Réunis*, he came to England and took up a post at the National Institute for Research in Dairying, at Shinfield. Subsequent appointments included research work into infantile gastro-enteritis at the Infant's Hospital, Vincent Square, S.W., and similar work for the London County Council.

Dr. Herschdoerfer joined Unilever in 1942, first in the Research Department at Port Sunlight and subsequently with the Food Research Department at Sharnbrook, Bedfordshire.

Adhesives for Packaging

A further Section of the new Packaging Code, Section 16, "Adhesives for packaging," has just been published and covers a field which was not dealt with in the earlier edition. In it the types of adhesives used for packaging are divided into nine broad groups as follows: animal and fish glues, bituminous adhesives, natural resins and gums, protein adhesives, rubber and latex adhesives, silicates and silicate mixtures, synthetic resin adhesives, vegetable adhesives, and waxes (microcrystalline).

James Clayton Prize

Mr. H. Hillier, O.B.E., M.I.Mech.E., M.I.N.A., the Engineering and Technical Director of G. and J. Weir, of Glasgow, has been awarded a James Clayton Prize to the value of £805 for his contributions to marine engineering, particularly in the field of auxiliary machinery, communicated in part in a paper submitted to the Institution of Mechanical Engineers during 1952. The James Clayton Prize was presented to Mr. Hillier at a general meeting of the Institution in London.

In 1948 Mr. Hillier was awarded the Thomas Hawksley Gold Medal, and in 1949 the Willans Premium, for another paper delivered to the Institution of Mechanical Engineers. In the Birthday Honours List of 1943, Mr. Hillier was awarded the O.B.E., for his services to the Admiralty and the Ministry of Supply before and during the war.

World Potentials of Food Supply

SIR ROBERT BARLOW REPORTS ON TOUR

The object of the tours made by Sir Robert Barlow in the Far East and Australasia was to see the business of Metal Box in its various ramifications and to study the possibilities of future developments.

Sir Robert said that it was customary to describe the can-making business as a secondary industry but, on the contrary, it was a primary one. If the chief material concerns of civilisation were adequately to feed the ever-increasing peoples of the world, to provide employment and contentment for the masses of the rural districts, and to increase standards of living, then the tin can took its place as perhaps the greatest single instrument to those objectives.

On the high veld of the Transvaal, the fertile plains of the Punjab and Southern India, the orchard and farm lands of Australia, the beautiful and fertile pastures of New Zealand, were to be found under-developed, in some places completely untouched, potentials of food supply.

Those potentials were not a remote possibility; schemes of irrigation and power supply, of steel production, and of transport and communications were being pressed forward to ever-increasing extent. These, together with the advances of agricultural skill, were already rendering fertile vast areas of differing soils in varying climates, capable of a great range of crops.

What was being done today by the canning industry was only symbolic of what could and would be achieved. It must be done not only because of the additional 20 million mouths that every year required to be fed, but also because the quickened spirit of the masses of the world would insist.

To pass from the appalling poverty and almost unbelievable crowding of India to the vast under-developed and under-populated continent of Australia and New Zealand with their high standard of living and all the riches that Nature had bestowed upon them was, said Sir Robert, for him a rather terrifying experience. It produced a sense of unbalance and disequilibrium which offended all natural laws and which could not remain static indefinitely.

The tin can (continued Sir Robert) seemed a poor defence against such a cataclysm and indeed even his enthusiasm did not go so far as to suggest that of itself it would be adequate; but he knew of no other single means by which so much benefit could accrue to so many, so quickly, and so efficiently.

The fields, the water, the power, and the transport were there; the workers were available, the mouths were hungry and, even where they were fed, variety in their diet was necessary.

The sweet corn or the beans, so rich in protein, of the Transvaal, or the dairy products and meats of New Zealand, or the fruits and vast range of foodstuffs of Australia, could only be brought to the masses of Singapore, or Calcutta, or Colombo, or the cities of Great Britain by the use of the tin can.

Those and other canned products could be transported without waste, without the need of labour in preparation, and with little need of fuel for cooking. Those aspects were important, for in Western countries the need to economise labour was vital, and in Africa and India the scarcity of fuel for cooking by the native population was endangering the productivity of the soil.

This emphasis on the value of the can was no flight of fancy. There was a prototype. What had the tin can contributed to the extraordinary development of America—the most remarkable phenomenon of the century? During the last 50 years, the U.S. population had risen from 70 millions to 150 millions and, contrary to experience elsewhere, the standard of living had expanded consistently. New York could not exist without it—merely in terms of logistics.

Sir Robert was convinced that many countries of the world must of necessity follow the example of America. Figures supported his conviction that the world canning industries were only in their infancy.

Metal Box served many countries, many industries, and many peoples. Not all of them had equal scope for development; there was not one that had so far even approached its peak. The company's main interest lay in the Commonwealth; Sir Robert was more convinced than ever that there could be no more fruitful or exciting fields for them, or for other British companies in which to operate.

Waterproof First Aid Dressing

Although fully alive to the danger of contamination from small wounds and abrasions, workers are reluctant to hamper the movements of their hands with clumsy dressings.

The washable dressings provided by Dalmas have many distinct advantages. Completely waterproof, greaseproof, and acid-proof, they give complete protection. The thin self-adhesive flesh-coloured plastic stretches and contracts in all directions.

Full Colour Packs for Frozen Foods

New packs carrying full colour photographs of the contents are to replace the familiar red, white, and blue cartons used by Birds Eye for their quick frozen foods.

The cartons are designed to give the impression that half the lid has been torn away to reveal the contents, brand recognition being maintained by the use of a large Birds Eye trade mark across the top of the carton.

Printed by photogravure and designed by Lintas, the new packs make it possible for the consumer to see at a glance what the carton contains, demonstrate the high quality of the product, and make a colourful display in the storage cabinet.

Plant Movement Control

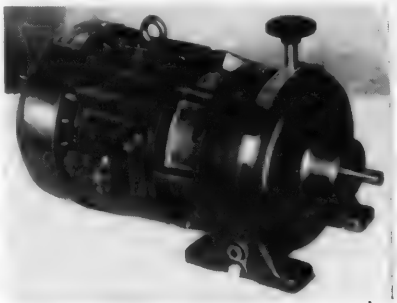
Speed variation in food manufacture is becoming increasingly essential for any moving equipment. Conveyors, mixers, washers, bottlers, and the like, are all improved if the rate of movement can be controlled.

The Kopp variator caters for the speed control of any machine, and gives infinite speed variation within a range of 9 : 1, that is, three times above and one-third below the input speed, the horsepower being constant at all speeds. It can be supplied with flange mounted motor and also with flange mounted reduction gear, which together makes a compact power unit.

In operation two rotating hard cones impinge upon a series of hard balls held in place by a ring, and variation is obtained by turning the balls upon their axis so that in the extreme positions one cone is supplying power on the equator and the other is taking off at the pole, and *vice versa*; thus any speed can be obtained, and there is no easier way of finding an optimum speed.

The speed control can be by lever or screw, the latter lending itself to remote control. It is a compact unit, co-axial, reversible, without slip and has no maintenance costs apart from the renewal of oil each 1,000 hours of running time.

Variators are made in six sizes from ¼ b.h.p. to 6 b.h.p. by Allspeeds.



A standard Kopp variator fitted with totally enclosed motor.

Window display of prepackaged fruit and vegetables at the Solihull store.

Prepacked Fruits and Vegetables

Early last year, British Cellophane, Heathbourne Produce of Wolverhampton, and Geo. Mason and Co. jointly planned a small market trial to find out reactions to prepackaged fruit and vegetables.

Altogether, some 22 items were prepackaged, the majority being in printed cardboard trays, overwrapped in Cellophane, sealed either by heat or with cellulose adhesive tape. The remainder were sold in film bags, while cauliflower, cabbage, and lettuce were wrapped directly in a sheet of film secured by adhesive tape. A semi-automatic machine was used for handling the trays overwrapped in heat-sealing film. The standard practice when wrapping fresh fruit and vegetables of perforating the wrap was followed in each case. This ensures an adequate supply of oxygen to the produce and so prevents rapid deterioration.

George Mason and Co. were responsible for retailing the packs, which were sold in three of their grocery provision stores in Wolverhampton, Moseley, and Solihull. The fact that prepackaged produce was sold in grocery stores rather than by the ordinary greengrocers is especially significant. The present methods of marketing fresh fruit and vegetables do not lend themselves to prepackaging at economic prices, quite apart from the inherent difficulty of persuading such a complex trade to undertake the internal reorganisation that would be necessary. The provision grocer on the other hand has already accepted prepackaging for most of his normal lines and if he sells produce at all he would certainly prefer it wrapped in convenient units, if only to keep his shop, assistants, and his grocery provisions as clean as possible.

The results of the 12 weeks' trial were impressive without being spectacular. The packs sold steadily throughout this period and the satisfaction of customers is shown indirectly by the fact that not one of them took advantage of the special guarantee offered with each pack.

It is obvious that any large scale development of fruit and vegetable prepackaging will require close co-operation between growers, packers, wholesalers, retailers, and the suppliers of transparent wrapping materials. In order to maintain the freshness of produce for as long as possible, especially in changing weather conditions, some system of storage in cool cabinets will be necessary at the packing station, the retail store, and possibly during transport. In this case the prepackaged produce was supplied direct to the shops by the packer, but in other circumstances the packing and delivery services might be necessary at wholesale centres.

Changes of Address

The Dublin office of Brian, Jenks and Co. has been moved from 79 to 59, Merrion Square. The telephone number, Dublin 66879, and the telegraphic address, Edibrian, Dublin, remain unchanged.

*

Musgrave and Co., St. Ann's Works, Belfast, have moved their London office from Commerce House, Newman Street, London, W.1, to 2, Howard Street, Strand, London, W.C.2, telephone number, TEMple Bar 2061-2.

The Newcastle offices of the company have now been moved from Clayton Street to 34, Great North Road, Newcastle-on-Tyne, 2 (Tel.: Newcastle-on-Tyne 26311).

*

The address of the Glass Manufacturers' Federation, the British Lamp-blown Scientific Glassware Manufacturers' Association, the British Chemical Ware Manufacturers' Association, the Lighting Glass Manufacturers' Association, and the European Glass Manufacturers' Federation is now 19, Portland Place, London, W. 1 (Tel.: LANgham 6952. Telegrams: Glassmanef, Wesdo, London).

New Marmalade Pack

A new line called Thick Chip Marmalade, of excellent flavour, has been brought out by James Keiller and Son.

Two examples of the Peek Frean souvenir packages, designed by Richard Lonsdale-Hands Associates, for distribution at the Ideal Home Exhibition.

RETIREMENT

Mr. John Kilgour, managing director Bon Accord Ice and Cold Storage Co. of Aberdeen, has retired after 44 years' service. He rose from office boy to director, joining the board in 1948. Mr. David Knowles, his assistant, will become manager and Mr. Kilgour will retain his seat on the board. He is also managing director of New Standard Cold Storage (Aberdeen) and will continue in that post.

A well-known figure in the industry, Mr. Kilgour was President of the Scottish Association of Cold Storage and Ice Trades from 1940 to 1945.

BOOKLETS RECEIVED

The many applications of Dexion are described in the current issue of *Dexion News*.

▪

The many uses of Fumite, the smoke insecticide which destroys insect pests without tainting, are described in a newly published leaflet.

▪

"The Manufacturers' Guide to Packaging and Packing" is the title of a handy booklet published by Samuel Jones and Co.

▪

Managers, supervisors, and workers' representatives, as well as practitioners and students, will find the Work Study Glossary, prepared by a committee appointed by the General Council of the Institute of Economic Engineering, to be useful for information and reference.

▪

Brochure No. 6 issued by the British Constructional Steelwork Association gives guidance on the design of metal arc welded steel building structures under nominally static loading conditions, made in mild and high tensile steels and designed as simple frames.

▪

An instruction handbook describing "Tru-Sil," a new range of powder flavours, has recently been issued by W. J. Bush. It contains recipes for the use of 19 flavours in blancmange powders, cake batters, cake mixes, table jelly crystals, biscuit fillers, and a large number of other products.

▪

Following the public statement on the general economic position issued by the Federation of British Industries jointly with the National Union of Manufacturers in July, the F.B.I. have now published the representations which it has made to the Chancellor of the Exchequer on the 1953 Budget. The representations are in two parts, the first dealing with Budget policy and the second with specific points of the tax law.

OBITER DICTA

● We would like more meat for our pasties; a good Cornish pasty is better than any sandwich and far more nourishing. —*A representative of Cornish china clay workers.*

● Sardines, like youth, are not what they used to be. Pre-war they were tiny, tender, tasty tots; post-war (with some few exceptions) they are large, lackadaisical, lustreless louts.—*Scottish retail manager.*

● If the retailers (of meat) were tied, with freedom of choice for the customers, the latter would be going round like lost souls looking for decent meat to eat.—*Executive member of the National Federation of Meat Traders' Associations.*

● There can have been few greater sources of irritation to the British housewife in recent years than sugar rationing. While all other countries are now rid of this burden she remains the Cinderella of the sugar "shortage."—*Yorkshire Evening Post.*

● In view of the blistering remarks by many women about the Coronation food bonus, would the Minister (of Food) substitute for the ox the more appropriate ceremony of roasting the Minister and his Parliamentary Secretary? — *Mr. Norman Dodds, M.P.*

● It is no exaggeration to say that the staple diet of a large proportion of the population of this country is depleted, stale, indifferently cooked stodge, with little or no fresh uncooked fruit and vegetables. — *Deputy Medical Officer of Health for Bournemouth.*

● The real truth of the food situation is not yet realised even among people who should know better; one of the greatest crimes of our generation is the fantastic grab of agricultural land which goes on every day. *Member of the National Farmers' Union.*

● Pickled herrings are sold in Holland on trolleys as we sell ice cream, and they have every advantage; they give one a splendid thirst, and are the cheapest and most appetising and nutritious article of food in this country, yet no one will eat them. — *Mr. R. Boothby, M.P.*

COMPANY NEWS

The payment of a final dividend on the Ordinary shares of 5 per cent., less tax, making a total of 7½ per cent., less tax, for the year, leaving a balance to be carried forward of £36,688, has been declared by Joseph Tetley and Co.

▪

The Board of George Cohen Sons and Co. have declared an interim dividend of 3½ per cent. on the increased Ordinary capital of £1,500,000 in respect of the year ending March 31, 1953. This compares with an interim dividend for the year ended March 31, 1952, of 8 per cent. on an Ordinary capital of £600,000.

▪

At a meeting of directors of the Beecham Group a second interim dividend of 19 per cent. actual, less tax, was declared on the Deferred shares of the company on account of the year ending March 31, 1953, making a total to date of 36 per cent. actual, less tax. This dividend is at the same rate as the second interim dividend paid in respect of the previous year, but is payable on the capital as increased by the issue of 2,700,000 new Deferred shares in April, 1952.

▪

The 7th Annual Report and Accounts of Negretti and Zambra, for the year ended September 30, 1952, have just been published. The report of the directors states that after making provision for depreciation and taxation, the accounts for the year show a profit of £84,099, which added to the balance brought forward from last year's accounts of £209,038, makes a total of £293,137. After deducting the preference and interim dividends, the balance is £283,949, from which it is recommended that the payment of a final dividend be made on the Ordinary Shares for the year to September 30, 1952, at the rate of 17½ per cent. per annum less income tax. The balance to be carried forward to next year's accounts will be £267,871.

▪

The report of the directors of J. and E. Hall for the year ended September 30, 1952, shows the net profit to be £57,462, to which is added the provisions for taxation made in previous years no longer required of £85,000, and the balance brought forward from last year of £225,564, making in all £368,026. After deducting a 6 per cent. dividend on the Preference Stock, and a 2½ per cent. interim dividend on the Ordinary Stock, a balance is left of £355,426. After a final dividend of 10 per cent. less income tax is paid on the Ordinary Stock which will absorb £35,280, a balance of £320,146 is carried forward to next year's accounts.

World Food News

Fisheries Ministers Meet

The Ministers of Fisheries of Denmark, Norway, and Sweden, and representatives from Iceland and the Faeroes, have met in Stockholm. One of the principal matters discussed was the international convention for the protection of fish stocks in the North Sea. Also discussed was the question of co-ordinating the Scandinavian countries' herring research work. A Scandinavian committee was appointed to pursue this matter.

Food Moisture Test

A new standardised test for determining equilibrium moisture of foods, released by the U.S. Packaging Institute, is claimed to predict with a degree of certainty how much of a moisture barrier a package will need to protect a food product from moisture gain or loss.

Since nearly all the flexible packaging materials will transmit water vapour to a greater or less degree, the packaging engineer endeavours to match the requirements with the proper barrier material without specifying a needlessly expensive or effective material.

Two methods are included in the newly proposed testing procedure. One is the method first proposed by Wink that requires upwards of three weeks to ascertain the relative humidity at which a food will neither gain nor lose moisture. The other, proposed first by Arthur H. Landrock of the Massachusetts Institute of Technology and a member of the Food Committee, will give the desired figures concerning equilibrium humidity in about half a day. Both methods yield essentially identical results, but the Landrock method requires an operator with greater skill and technical training.

Belgium's New Margarine Factory

A new factory, incorporating the latest developments in plant and equipment, has been opened at Merxem by the *Union Margarinière Belge* (U. M. B.), a Unilever subsidiary already responsible for 70 per cent. of the total annual Belgian output (in 1951) of 67,000 metric tons.

Groundnuts, soya beans, palm kernels and other tropical oil-bearing materials are imported *via* Antwerp to the oil extracting plant at Baesrode, and the crude oil is refined partly at Baesrode and partly at Merxem, the operations comprising neutralisation, decolorisation, filtration, and deodorisation. Then comes the first stage proper in margarine manufacture in which homogenisation of the correctly proportioned mixture of vegetable oils, pasteurised milk, lecithin, and starch is carried out. Each ton of mix also receives several million international units of vitamins A and D.

Passing through a system of stainless steel pipes, the liquid margarine comes into contact with the outer wall of a refrigerating column at −20°C., solidifies in a thin film, and is detached by a knife to fall continuously into the kneader from which it emerges in a plastic, homogeneous state into aluminium trolleys for transport to the wrapping machines.

An Archimedean screw pushes the margarine into the matrix for cutting into blocks which proceed *via* chutes successively into a machine for pressing into cubes, and one for wrapping the cubes in parchment paper and impressing the guarantee, date, and price. An endless belt carries the cubes to the boxing machines (five cubes per box) which are automatically sealed before being carried by conveyor to the loading quay where they slide into towing barges which arrive at the warehouses on the same day of production of the margarine. At no stage of the entire process are any of the materials touched by hand.

News from Norway

With its present issue (January to February, 1953), *The Norseman* celebrates its tenth anniversary. First published in war-time London as a free forum for the discussion of events and ideas of common interest to Norway, her allies, and her northern neighbours, the review has grown and developed, containing articles on many themes.

In the current issue is contained an interesting discussion on the Icelandic Fisheries Dispute.

Transport Costs from Italy

The continental railways concerned have prolonged until October 31, 1953, the special rates in force for the transport of oranges and lemons in transit *via* Modane and Chiasso to London. The prices will be applied on a reimbursement basis. At the same time a new table of prices has come into force for direct transports from Modane and Chiasso to any locality in England.

Special charges are being maintained until November 14 for the carriage of oranges and mandarines loaded in full waggons and travelling at low speed from Italy to French, Belgian, and Dutch ports on the Channel and North Sea, if they are definitely destined for England. The port dues must be paid entirely either by the consigner or by the consignee.

The special rates are conceded both to consignments despatched from Italy with a through bill of lading and to those reloaded at Chiasso. Materials of protection against heat or cold will be transported free of charge in quantity not exceeding 10 per cent. of the weight of the goods.

The rates are inclusive of the fees for customs formalities, Swiss statistical dues, registration and stamp duties, and Dutch station fees. The above facilities will come to an end on November 14, 1953.

Canned Irish Stew for U.S.

The first consignment of canned Irish stew, amounting to 12 tons, was shipped to the United States in February by Canned Products, Ltd., producers of "Emerald" brand products. This company started operations in November, 1950, and in the past 18 months have produced over 10,000,000 lb. of finished processed foods. Two of their biggest exports are frozen beef to the U.S.A. and canned beef to Britain.

Chilled Beef for Britain

Argentine shipments of chilled beef to Britain, suspended during the war because of handling difficulties, were resumed on February 16 when 170 tons were loaded on board the *Paraguay Star*. It was expected that more than 500 tons would be sent in other ships before the end of February.

In the meat treaty between Britain and Argentina, signed last December 31, Britain agreed to buy unlimited quantities of top-class chilled meat at £181 sterling a long ton.

Yugoslav Agricultural Production

Yugoslav agricultural experts are perturbed by lower post-war production of grain, lard, and meat in relation to pre-war figures.

Average annual output in the period 1930-39 was 2,611,000 tons of wheat and rye, 4,245,000 tons of maize, 386,000 tons of meat, and 115,000 tons of lard.

In the period 1947-52 inclusive, the annual average has declined to 2,317,000 tons of wheat and rye, 3,252,000 of maize, 340,000 of meat, and 110,000 tons of lard.

The decline in output is attributed partly to the effects of the droughts in 1950 and 1952, but also to increased sowings of industrial plants and fodder, as well as of vegetables.

OVERSEAS ENQUIRIES

Canned and Prepacked Foods

Narok A.G., of Löwenstrasse 2, Zürich, 1, wish to represent United Kingdom manufacturers of canned fruits (particularly canned pineapples and other soft fruits), canned vegetables (particularly strained vegetables for baby foods), and prepacked cooked foods (but not canned spaghetti, puddings, etc.).

Founded in 1934, the company own a coffee plantation in Tanganyika and import coffee, selling it direct to retailers and hotels. They are therefore in close touch with the retail trade and in a good position for introducing fresh articles to the market.

United Kingdom firms who are interested in this enquiry are asked to communicate with Narok A.G. direct.

*

Frozen Fish

J. and S. Distributing Corp., of 331, Balter Building, New Orleans, Louisiana, have expressed interest in representing a United Kingdom firm for frozen fish in the south-western area of the United States.

This is a recently formed firm of distributors, the President of which is well acquainted with the frozen fish trade, having owned and operated a plant in America. The Corporation is considered a suitable connexion for United Kingdom suppliers.

United Kingdom firms who are interested in this enquiry and who are able to supply should communicate by air mail direct with the American firm, sending:

1. Details of varieties of fish offered.
2. Price per pound quotations in dollars c.i.f. east coast port.
3. Packing and shipping details with samples of packaging if possible.
4. Indication of delivery dates and terms of business.

Letters should be addressed to Mr. J. C. St. Amant, President.

The foodstuffs mentioned in this circular are subject to the United States Food and Drugs Administration Regulations, details of which are available from the Commercial Relations and Exports Department of the Board of Trade.

*

Foodstuffs and Insecticides

Mr. S. P. Dunbar, Vice-President in charge of sales of Hofmann Industries Inc., Sinking Spring, Pennsylvania, is interested in establishing agency connexions with United Kingdom manufacturers of canned and packaged foodstuffs and of domestic insecticides, particularly if available in some distinctive new form.

Hofmann Industries Inc., have been in business for 30 years and are themselves manufacturers of brooms, mops, tubular steel, and plastics. They are reported to have five divisional sales managers and to employ the services of 63 brokers throughout the United States, and through their organisation to have access to all the main grocery concerns and chain stores. They are considered a suitable connexion for United Kingdom firms.

The foodstuffs mentioned in this circular are subject to the United States Food and Drugs Administration Regulations.

Any manufacturers interested in this enquiry are requested to write direct, by air mail, to Mr. Dunbar at the address given above, giving prices c.i.f. in dollars.

*

Sugar "Window" Eggs

Tasso Plantation Foods, of 335, Mehle Avenue, Arabi, Louisiana, have expressed interest in corresponding with United Kingdom manufacturers who would be interested in producing crystallised sugar eggs of the decorated "window" type.

The company are themselves manufacturers, but wish to make arrangements for an additional source of supply.

United Kingdom manufacturers who intend responding to this enquiry should communicate by air mail with the American firm direct, addressing correspondence to Mr. C. P. Ellis, who intends to visit the United Kingdom in the near future to finalise arrangements. Offers should include:

1. Price details in dollars, c.i.f. New Orleans.
2. Indication of delivery dates.
3. Samples (to be sent if possible).

The company have stressed their ability to instruct potential United Kingdom manufacturers in special production methods involved and will send a representative to the United Kingdom for this purpose as soon as preliminary contacts are made.

The product mentioned is subject to the United States Food and Drugs Administration Regulations.

*

Beverages, Spices, and Seeds

The Société Libano-Arabe pour le Commerce of B.P. 384, Beirut, have expressed interest in receiving quotations from United Kingdom suppliers of coffee, tea, spices, linseed, and hempseed.

The Lebanese firm were founded in November, 1951, as an exporting house, commission agents, and manufacturers representatives, and already represent several United Kingdom firms for various goods.

United Kingdom firms who are interested in this enquiry should send details and prices of their commodities to the enquiring firm direct.

Beer and Biscuits

Bowen and Bowen, P.O. Box 165, Belize, British Honduras, wish to represent United Kingdom manufacturers of the following products in the Colony of British Honduras:

Beer, Lager or light Pilsner type. Heavier beers are not popular in the territory and there is no market for them.

Sweet biscuits.

Interested firms are asked to communicate direct with Bowen and Bowen.

Good Hunting in Antarctic

The latest report from the Antarctic is that up to January 31 the seven Norwegian pelagic whaling expeditions produced 337,365 barrels of whale oil. This is equal to about 56,000 tons. The season opened on January 2. Results so far are considered in Norwegian whaling circles to be good. Last winter 10 Norwegian pelagic expeditions were in the Antarctic, and produced 354,300 barrels of whale oil in 23 days. In the 1951 season, 10 expeditions produced 344,600 barrels in 28 days. This season's seven expeditions are operating with 95 catcher boats, and the output of whale oil per catcher boat per day has so far been 118 barrels, compared with about 107 barrels average during the four previous seasons.

Menu Quiz

At the California Section Award banquet of the American Chemical Society, diners took their places and glanced at the menu to see what the fare would be. The menu turned out to be a masterpiece of scientific circumlocution.

A rapid survey of 36 diners showed that 18 guests or non-A.C.S. members had scores averaging 8·2 correct answers out of 10 possible. The 18 A.C.S. members did slightly better—their average was 8·9.

PERIODIC TABLE OF GUSTATORY ELEMENTS

Undistilled Spiritus Vini Vitis, Rouge
Brine-Propagated Crustacean Fragments

Lamellar Fibrous Cellulose Tumbled with Triglyceride-Acetic Acid Emulsion

Hemisection of Radiant Heat-Modified Avian Protein
Autoclaved Heterogeneous Hydrate of Carbohydrates and Natural Steroids
Chlorophyll Spheres Petites
Thermoset Yeasted Carbohydrate, Butyrated

Alginate Stabilised Microcrystalline Lactic Colloids (m.p. 0°C.), Flavoured with Vanillaldehyde

Caffeine Percolate (v.p. 760 mm.)

The translation is: Red wine, seafood cocktail, tossed salad with French dressing, half roast chicken, dressing, green peas, rolls and butter, vanilla ice cream, and coffee.

France Suspends Sugar Import Duty

The French Finance Ministry has suspended the 130 per cent. import customs duty on cane and beet sugar. This suspension will remain effective until August 31, 1953.

Herring Fisheries Yield

The biggest catch ever brought ashore on a single day during the Norwegian winter herring fisheries was recorded recently, when the seas off West Norway yielded altogether 93,000 tons of herring. Since the herring fisheries started in late January and up to February 9, the yield has been altogether 344,100 tons compared with 446,400 tons up to February 9 last year. The catch so far brought ashore this season exceeds 1,000 million large herrings. More than 12,000 fishermen and 3,000 vessels are engaged in the Norwegian winter herring fisheries, which are the largest seasonal fisheries in the world.

Irish Meat Processing Plant

A new meat processing plant with a capacity of 1,000 carcasses a week has been opened at Rathkeale, Co. Limerick, by Shannon Meat Ltd. When fully developed, it will be one of the largest and most up-to-date of its kind in Ireland for chilling, freezing, and canning.

A first-class market at the doorsteps of farmers in an important dairying and cattle raising area, the factory will number among its by-products dried blood for fertilisers and animal feeding, bone meal, and inedible fats.

When the cattle have been killed they will be shifted on roller bearing conveyors for the removal of the hides, after which an electrically operated saw will cut the carcasses in two. When dressed, the meat will be removed on overhead rails to one of the four departments for chilling or deep freezing, the offals having been segregated into edible and non-edible classes and conveyed mechanically to adjoining sections for conversion into by-products. A canning department has yet to be completed.

Depending on seasonal conditions and output, water up to 15,000 gallons an hour is required for the refrigeration plant. To obtain this, advantage has been taken of a deep depression outside the factory by filling it with water to form an artificial lake 130 yards long and 25 yards wide, holding about 1,000,000 gallons.

Herring Venture

Fishermen from Romsdal in Norway are joining an expedition to catch herring off West Africa. Rolf D. Stensholt, who leads the venture, will shortly have two fishing vessels ready. £22,500 has been invested in the enterprise. Stensholt declares that enormous quantities of herring are found off West Africa, and are eminently suitable for conversion into meal and oil.

News from the Ministries

The Bacon Order, 1953

The Bacon Order, 1952, was replaced last month by the Bacon Order, 1953. The principal changes contained in the new Order are as follows:

1. Maximum prices are prescribed for gammon sold by wholesalers to canners and for knuckles and sheet ribs sold by wholesale.
2. The additional charge that may be made by retailers on a sale of skinless uncooked Belfast hams is increased by 2d. a lb.
3. The method of calculating the discount allowed on the fixed wholesale prices of bacon is simplified.

Oils and Fats

Some of the restrictions on the production, sale, or use of certain oils and fats were removed on February 15, 1953, when the Oils and Fats Order, 1952, as amended, was replaced by a new Order, the Oils and Fats Order, 1953.

Under the new Order, the remaining restrictions on the production and use of linseed oil will be removed. In particular, licences to crush linseed will no longer be needed.

The prohibition on the use for food of technical tallow and rendered pig fat (other than lard) will be relaxed. This prohibition was introduced in 1949 chiefly because of the shortage for industrial purposes of these types of fat. Producers may now sell and food manufacturers may buy and use, subject to certain conditions, technical tallow and rendered pig fat (other than lard) that is wholesome and suitable for human consumption.

All restrictions will be removed on the sale of fat (known as "cookhouse fat" or "skimmings") resulting from the cooking of ham or bacon for sale. The necessary amendments have also been made to the Fats and Cheese (Rationing) Order, 1952, with effect from February 15, 1953.

Sausages and Sausage Meat

Price control of uncooked pork and beef sausages and sausage meat ended on March 1, 1953. From the same date minimum meat contents, which it has been necessary to specify while price control has been in operation, ceased to be required.

When the Minister of Food announced on December 22, 1952, that meat products (except uncooked sausages and sausage meat and canned corned meat) would be decontrolled from January 1, 1953, he said that the controls on uncooked sausages and sausage meat would "be reviewed shortly in the light of current and future supplies of meat." Since then, it has been possible to make available to the trade additional quanties of meat for manufacturing purposes and the Minister feels that he can now leave manufacturers free to provide at competitive prices the widest possible varieties of sausages so that all kinds of local and personal preferences of customers can be satisfied again.

To protect the consumer, however, the use of those offals which are unsuitable in uncooked sausages and sausage meat will continue to be prohibited under a new Order, the Offals in Meat Products Order, 1953, the provisions of which will also apply to other uncooked open meat products. This Order came into force on March 1, 1953.

Canned corned meat remains subject to rationing and price control. The present maximum retail price of 3s. a lb. prescribed in the Meat Products (No. 3) Order will be continued in a new Order, the Canned Corned Meat (Prices) Order, 1953, which also came into force on March 1, 1953.

Cream to be Available

Fresh and sterilised cream will be freely available this year from April 1 until the end of July. There will be no price control.

Arrangements will be made for imports of fresh and canned cream during the period when home sales are permitted from the sterling area, and also for limited quantities from the Continent.

Standards for cream are laid down in the Food Standards (Cream) Order, 1951, which prescribes the following minimum milk fat contents:

(*a*) Cream: A minimum of 18 per cent. of milk fat. (This standard applies to cream sold as such or under a description such as "single cream," "fruit cream," or "coffee cream.")

(*b*) Double or thick cream, and clotted cream: A minimum of 48 per cent. milk fat.

(*c*) Sterilised cream: A minimum of 23 per cent. milk fat. (This standard is intended to relate to tinned sterilised cream, bottled sterilised cream, etc.

The Order applies to all cream, whether home-produced or imported, including cream sold by catering establishments.

Agricultural Camps to Re-open

The Ministry of Agriculture and Fisheries has announced a programme of Volunteer Agricultural Camps on the same lines as in previous years. The Ministry will ask for some 50,000 volunteers for between 40 and 50 camps, situated in areas where volunteer labour is still a vital factor in the gathering of the harvest, particularly the potato crop.

Rates of pay, charges for board and accommodation, camp locations, and other details will be announced shortly.

Allocation of Canned Salmon

The allocation of canned salmon for ration period No. 12 (which began on March 22, 1953) will consist of the following: Group 1 and Group 3 salmon, 48/1, 96/½ *or* 96¼. About 25 per cent. of the allocation will be Group 1 salmon and 75 per cent. Group 3 salmon. For this allocation one unit will be worth the equivalent of ¼ lb. salmon.

A trader's entitlement applies to his total allocation of salmon and not to each group or size included in the allocation. Wholesalers are not obliged to break bulk and retailers cannot therefore expect to receive their supplies in the exact proportions indicated above. First hand distributors and wholesalers are asked to distribute their supplies as fairly as possible.

Decontrol of Eggs

The Government have now decided, in consultation with the National Farmers' Union and the representatives of the packers, wholesalers, and other interests concerned, on temporary arrangements for egg marketing after decontrol. These arrangements operated from March 26, on which date the allocation and price control of eggs ceased, until permanent plans can be brought into operation.

The existing machinery of the Ministry of Food will be used to operate the guarantees of price and market under Part I of the Agriculture Act, 1947, and to provide certain services, such as market intelligence and a supply of egg boxes, for packing stations or producers. A National Committee comprising representatives of the farmers, the packers, and the distributive trade will be set up to advise the Ministry of Food on any policy questions arising in the performance of these functions and to exercise certain executive functions in their day-to-day operation. Area advisory committees comprising the same interests will also be set up.

This use of the existing machinery of the Ministry of Food is a temporary expedient. It is important that these interim arrangements should not jeopardise the long-term scheme to be introduced at a later stage. For this reason especially the Government, and the industry, attach great importance to the maintenance of satisfactory quality standards for home-produced eggs. It is therefore proposed to require that all eggs should be sold by grade and weight. The only exception to this will be sales of eggs by producers direct to consumers for consumption in private households. The Ministry of Food will continue to license packing stations for grading purposes.

Guaranteed prices and assured markets under the Agriculture Act, 1947, will be implemented by packing stations being required to accept from producers all eggs offered to them and to pay not less than the guaranteed minimum price current at the time. Packing stations will be free to pay producers more than the guaranteed price according to market conditions. Guaranteed minimum prices on a seasonal basis will be determined in the light of the Annual Review. When accepting eggs at the guaranteed prices packing stations will be operating on behalf of the Ministry of Food, which will carry any loss involved in disposing of eggs so bought.

De-rationing of Animal Feedingstuffs

In a joint announcement by the Ministry of Agriculture and Fisheries and the Ministry of Food, it is stated that there appears to be some misunderstanding about when the rationing of animal feedingstuffs will end. It is important that farmers and keepers of domestic livestock understand that rationing will continue until August 1.

Until then coupons are necessary for the purchase of rationed feedingstuffs. Coupons issued only on application must be applied for in the usual way.

Specially Designated Milk

A further step has been taken towards the specification of four more areas in England in which milk of special designations only (that is pasteurised, sterilised or tuberculin tested milk or, until September 30, 1954, accredited milk from a single herd) may be sold.

The Milk (Special Designations) (Specified Areas) Order, 1953, is now laid in draft before Parliament, for the requisite 40 days, which provides that from May 1, 1953, in the Brighton, Sheffield, and Southampton areas, and from November 1, 1953, in the Stoke-on-Trent area, all milk sold by retail must be specially designated milk.

On November 20, 1952, the Minister of Food announced his intention, subject to any representations that might be made, of laying such an Order before Parliament to come into force not earlier than April 1, 1953. The Minister has now considered the representations made to him and has decided to proceed with the specification of all four areas.

Details of these areas are as follows:

1. Brighton and District: Consisting of the County Borough of Brighton, the Borough of Hove, and the Urban Districts of Portslade-by-Sea, Shoreham-by-Sea, and Southwick.

2. Sheffield and District: Consisting of the County Boroughs of Barnsley, Rotherham, and Sheffield, the Urban Districts of Cudworth, Darfield, Darton, Dodworth, Hoyland Nether, Rawmarsh, Royston, Swinton, Wath-upon-Dearne, Wombwell, and Worsborough, and the Rural District of Rotherham.

3. Southampton and District: Consisting of the County Borough of Southampton, the Borough of Eastleigh, and that portion of the Rural District of Winchester consisting of the Parishes of Bursledon, Hamble, and Houne.

4. Stoke-on-Trent and District: Consisting of the County Borough of Stoke-on-Trent, the Boroughs of Congleton and Newcastle-under-Lyme, and the Urban Districts of Biddulph and Kidsgrove.

Bread Subsidy for Scotland

After consultation with the bakery trade, the Minister of Food has announced that the rate of bread subsidy payable in Scotland from April 13, 1952, to May 10, 1952, is 11s. 10½d. per sack. From May 11, 1952, the rate is increased by 2s. 2d. per sack to take account of the changes in the prices of flour and bread on March 16, 1952. This brings the subsidy up to 14s. 0½d. per sack. The rate is further increased by 10d. per sack from June 1, 1952, to take account of a wages award to bakery operatives, thus making the subsidy 14s. 10½d. per sack. This is the final rate up to November 1, 1952. Thereafter, until further notice, 14s. 10½d. will continue to be paid as a provisional rate pending the next review based on costings in November, 1952.

Provision has been made, on subsidy claim forms already issued, for payment at the rate of 11s. 1½d. per sack from April 13 to May 10, 1952; at the rate of 13s. 3½d. per sack from May 11 to May 31, 1952; and at the rate of 14s. 1½d. per sack from June 1, 1952, to January 24, 1953. A balance of 9d. per sack is therefore due from April 13, 1952, to January 24, 1953, and a supplementary claim form (B.S. 87A) will be issued to provide for the payment of this balance.

Information and Advice

This Service is available to subscribers to FOOD MANUFACTURE. If a stamped addressed envelope is enclosed replies will be sent by post, but enquiries cannot be answered by telephone.

Vienna Sausages

B.6337. *We should be pleased to receive a formula for the manufacture of Vienna sausages.* (Wilts.)

The following formula is given as a basis for trial:

	lb.
Veal trimmings	20
Bull beef	20
Ox cheek	20
Pork trimmings	40
Nitrite cure	3¼
Sugar	½
Milk powder	4
Cracked ice	20

Seasoning:	*oz.*
Ground white pepper	3
Ground mace	2
Ground coriander	2
Ground cayenne pepper	½

Cure:	
Salt	100 lb.
Sodium nitrite	8¼ oz.

The veal, bullmeat, and ox cheek are run through a ¼ in. plate of the mincer, and then covered with the cure, the sugar being added. These ingredients are then mixed thoroughly, run through a ⅛ in. plate, and packed down to cure overnight at a temperature of 40°F. The pork is then broken down on a ⅛ in. plate. The cured meats are put in a bowl cutter, and chopped for about 2½ minutes before the milk powder, spices, cracked ice, and finally fresh pork are added. The chopping is continued for two to three minutes until all the ice has been taken up as water, and the mixture is filled into narrow hog casings, smoked until well coloured and perfectly dry, then immediately cooked at 170°F. for eight minutes. The sausages can be immersed in ice water to "plim" them up.

Synthetic Cream

B. 6382. *Could you please let us have a formula for synthetic cream?* (Scotland.)

The following formula is given as a basis for trial:

	Per cent.
Fat	33-36
Sugar (or glucose)	1·0
Salt	1·0
Emulsifying agent	1·0
Aqueous stabiliser	64-61
Colour and flavour	to taste

If the fat available is in the form of margarine, an analysis of this is necessary to determine, for each batch used, its fat and salt contents. The margarine content of the cream formula can then be adjusted to give a fat content of 33 to 36 per cent. With margarine fat, it may be found better to maintain the fat content nearer the higher figure than the lower, since the fat present in margarine has usually a lower melting point than that of the commercially available hydrogenated groundnut oil. The salt content of the margarine used should also be taken into account in calculating the amount of salt required per batch of cream.

It is not necessary to use both sugar and glucose. Normally about 1 per cent. of sugar will be found adequate, but this may be replaced by about 1·5 per cent. glucose. Only just enough of either should be used to give the desired sweetness to the cream, since sugar or glucose in solution encourages unwanted bacteria.

As emulsifying agent, dried egg powder is ideal, but albumin may be used instead. The exact amount required will have to be found by experiment; about 1·0 per cent. will be sufficient and should be dissolved or dispersed in the aqueous phase.

The aqueous phase, containing the stabilising agent, is important. A 0·75 to 1·0 per cent. solution of methyl ethyl cellulose is very good. The exact percentage varies according to the desired viscosity of the resultant cream. Glyceryl monostearate may be used, but generally the cellulose derivative is better and has little attraction for bacteria.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.6344. *Baking powder.* (Suffolk.)
B.6346. *Canned brisket.* (London.)
B.6347. *Fondant.* (N. Ireland.)
B.6348. *Apple pectin.* (Wilts.)
B.6350. *Rose hip extract.* (U.S.A.)
B.6352. *Pea steeping tablets.* (Herts.)
B.6353. *Entoleted bread.* (Kent.)
B.6357. *Potato straws.* (Warwicks.)
B.6361. *Corn syrup.* (London.)
B.6362. *Bottling beetroot.* (Lancs.)
B.6363. *Grinding equipment.* (Mon.)
B.6364. *Smoke ovens.* (Yorks.)
B.6369. *Jellied eels.* (London.)
B.6372. *Stainless steel kettles.* (Canada.)
B.6373. *Dextrine, dextrose, and maltose.* (Hants.)
B.6375. *Hydrogenated oils.* (Northumberland.)
B.6380. *Marshmallow beating machine.* (Glam.)
B.6381. *Lemonade tablets, chewing gum, and bubble gum.* (Surrey.)
B.6383. *Liver extract.* (Herts.)
B.6384. *Labels.* (Cyprus.)
B.6385. *Standards for synthetic cream.* (Lancs.)
B.6388. *Metal caps.* (Lincs.)
B.6399. *Egg stamping equipment.* (Lancs.)
B.6400. *Centrifugal driers.* (London.)
B.6401. *Glacé cherries.* (London.)
B.6402. *Electrode boilers.* (Berks.)
B.6404. *Chocolate vermicelli and chocolate cases.* (Scotland.)
B.6405. *Soft drinks.* (S. Rhodesia.)
B.6406. *Fruit juices.* (London.)
B.6407. *Laminated transparent film.* (London.)
B.6408. *Iced lollies.* (Ireland.)
B.6409. *Potato crisps.* (N. Ireland.)
B.6410. *Methyl ethyl cellulose.* (N. Ireland.)
B.6411. *Drum drying of carrots.* (Yorks.)
B.6412. *Ham canning.* (Lancs.)
B.6413. *Pneumatic floor scrubber.* (Scotland.)
B.6414. *Stainless steel utensils.* (Cheshire.)
B.6415. *Monosodium glutamate.* (London.)

Recent Patents

689,154. STANDARD BRANDS, INC.: Tea extraction.
689,160. FRISSE, R.: Conches for the manufacture of chocolate.
689,168. ELVIS, W. H.: Pastry moulding machines.
689,170. WIGGINS, L. F.: Process for the manufacture of refined sugar cane wax.
689,171. POLYSULPHIN CO., LTD.: Detergent compositions.
689,172. READS, LTD., and GILES, A. J.: Metal containers and their closures.
689,173. WHITCHER, R. S., and WYATT, G. O.: Device for handling eggs.
689,204. ROSE CONTAINERS, LTD.: Cartons.
689,210. NAAMLOOZE VENNOOTSCHAP TECHNISCH VERKOOPBUREAU MARJA and DOMENSINO, H. W. M.: Apparatus for sterilising or pasteurising foodstuffs contained in bottles or cans.
689,260. FORGROVE MACHINERY CO., LTD.: Wrapping machines.
689,276. WESTWOOD RIM AND PATENTS, LTD., WESTWOOD, S. C., and WESTWOOD, N. F.: Closure caps for necks of liquid receptacles.
689,373. ST. REGIS PAPER CO.: Apparatus for closing paper bags.
689,399. ALBON AND SONS, LTD., R. J.: Apparatus for coating or surface treating the interiors of drums or the like.
689,404. WINGFOOT CORPORATION: Manufacture of wrappers for packaging.
689,431. MEDWAY PAPER SACKS, LTD.: Bag filling machinery.
689,456. JERVIS, A. E.: Hopper feed mechanisms.
689,468. FISHER AND LUDLOW, LTD.: Pallets.
689,812. WRIGHT'S BISCUITS, LTD.: Apparatus for handling biscuits.
689,838. BOXFOLDIA, LTD.: Folding cartons.
689,851. METAL CLOSURES, LTD.: Closures for bottles, jars, cans, and the like.
689,912. ALKA, LTD.: Cap closing devices for closuring bottles and the like.
689,918. CHURCH, G. T.: Machines for washing or cleaning eggs.
689,943. MILLER, LTD., J., and THOMSON, J.: Baking of bread.
690,000. PERMUTIT CO., LTD.: Apparatus for treating water with chemical reagents.

Abstracts of Recent Specifications

Fruit Picking Devices

This invention relates to fruit picking devices of the kind comprising a number of fingers or the like between which fruit laden branches or stems may be drawn, the distance between the fingers being such as to pluck off the fruit while permitting the passage of the branches, stems, and leaves, and a collecting container arranged to receive the stripped fruit.

The device is characterised in that the opposed edges of adjacent fingers are provided with marginal portions which are resiliently yielding in a direction transverse to a plane containing the fingers and in the direction of movement of the fruit laden branches through them.

It is found with this arrangement that there is less likelihood of the fruit being damaged and fewer of the leaves becoming detached. Also the unripe fruit which is more firmly attached to stalks will not be plucked.

684,353. *Richard Francis Orme Grafton.*

A New Dough Machine

This invention relates to a machine for transforming shapeless lumps of dough into parallel-sided rolls and to that type of machine in which the shapeless lump of dough is first transformed into a ribbon which is then rolled upon itself to form a roll suitable for putting in tins. Various machines have been proposed for performing this operation and the present invention has for its object the introduction of an improved means for rolling the ribbon of dough upon itself after it has passed between ribbon forming rollers with a view to obtaining a maximum tightness of roll, thereby eliminating excess air likely to be trapped during this operation and producing a loaf which, when baked, will be of a fine and uniform texture.

684,627. *John Horace Garner.*

Vacuum Containers for Preserved Foodstuffs

Vacuum containers are usually difficult to open and in many cases cannot be reclosed for continual or repeated use, because the lid or cover cannot be removed easily without damage.

This invention consists of a seamless metal vacuum container for preserved foodstuffs, having a self-centring detachable metal cover provided with a vent hole, an annular sealing member, and a stopper for the vent, in which the cover is made resistant to buckling by forming it with an annular rib, the rib being spaced from the vent hole so as to permit the stopper to be grasped for removal and being of sufficient height to shield the stopper when in place.

The vent hole is preferably centred in a deep-drawn conical depression, the stopper being also of conical shape, and there may be provided a spring clasp, the central portion of which is adapted to bear against the annular rib at two positions spaced on opposite sides of the vent.

The container and its cover may be made of aluminium or an aluminium alloy, or of tinplate or sheet iron, treated with suitable lacquer or varnish, resistant to corrosion by the contained foodstuffs.

685,380. *Ernst Weisse.*

Manufacture of Ice Lollipops

This invention relates to the manufacture of ice lollipops and its object is to provide means for facilitating quick filling of moulds with liquid lollipop mixture to be frozen and quick removal of the lollipops.

The mould comprises a container having spaces shaped for two or more lollipops, the spaces being in line side by side joined by their side walls. Partitioning means are provided between the spaces which partly separate the spaces to facilitate breaking the lollipops apart from each other but leave the spaces in communication with each other, at least at the upper ends thereof, whereby the spaces communicate with each other so that liquid filled into one space will flow into and fill the other space.

Thus the liquid lollipop mixture can be poured into one end of the mould and will fill all the lollipop spaces. A number of these moulds can then be placed in a refrigerating chamber and, when frozen, the lollipops, while still joined together, can be removed and easily broken apart.

682,928. *Arthur Albert French and Arthur Norman McGregor.*

A New Vitamin B_1 Salt

This invention relates to the production of a sparingly soluble vitamin B_1 salt, *viz.* vitamin B_1 naphthalene-1,5-disulphonate. The salt is combined with foodstuffs, especially farinaceous substances, such as flour, noodles, and spaghetti.

When mixed with flour or other farinaceous substance and stored under usual conditions, the vitamin B_1 naphthalene-1,5-disulphonate preserves its physiological activity for a much longer time than the di- or mono-hydrochloride of vitamin B_1.

Compared with the likewise relatively stable monosalts of vitamin B_1, such as the mononitrate, the monobromide or the monoiodide, the vitamin B_1 naphthalene-1,5-disulphonate is considerably less soluble in aqueous or alcoholic solvents, so that it can be obtained from its solutions by precipitation or crystallisation with better yields than the monosalts mentioned.

685,667. *Farbenfabriken Bayer.*

Improvement in Baking Products

The invention is concerned with the improvement of bakery goods generally which are prepared from flour and shortenings and other conventional ingredients such as milk, sugar, egg material, leavening agents, typical of such bakery goods being bread, rolls, buns, biscuits, muffins, cakes, waffles, and doughnuts.

Bakery goods, shortenings, and farinaceous preparations for use in the production of bakery goods may be considerably improved by incorporating therein certain addition agents of non-toxic or innocuous character. These addition agents are esters of alcohols containing a chain of at least eight carbon atoms with a lower molecular weight carboxylic acid ester of an hydroxy polycarboxylic acid.

So far as the bread dough is concerned, the incorporation or the inclusion therein of the defined carboxylic acid ester addition agents results in the production of a silkier and drier dough and one which is easier to handle in make up than the same dough without the addition ingredients. So far as the final baked bread or finished loaf is concerned, such incorporation brings about decided improvements in texture, softness and silkiness of feel, tenderness of crust and crumb, and excellent chewing characteristics, as well as an improvement in volume and the retention of softness and flavour over long periods of time than in the case where such addition agents are not utilised.

In the case of cakes, the texture is improved and the process also makes possible the production of cakes with increased volume particularly where the amount of sugar in relation to the amount of flour is particularly high. In the case of shortenings containing the addition agents, the shortenings are more readily dispersed in the dough batch and take up the aqueous material in a more ready manner than in the case where such addition agents are not utilised.

684,620. *The Emulsol Corporation.*

Recent patents and trade marks have been selected from the "Official Journal of Patents" and the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

Trade Marks

TIELEMAN AND DROS.—698,194. Vegetables, fruit, and fish, all being preserved foodstuffs; and meat, meat products for food for human consumption, soups, jams, salad dressing, and pickles. **Hendrikus Hemmes Tieleman, Adriaan Hendrik Dros,** and **Cornelis Willem Tieleman** trading as **Tieleman and Dros Commanditaire Vennootschap/op Aandelen** (a Limited Partnership organised under Dutch law), Middelstegracht, 97, Leiden, Holland; Manufacturers and Merchants.

BACKIN.—702,987. Chemical substances used for preserving foodstuffs. **Rudolf August Oetker** and **Ursula Oetker** trading as **Dr. August Oetker** (an Offene Handelsgesellschaft organised and existing under the laws of Germany), Lutterstrasse 14, Bielefield, Germany; Manufacturers and Merchants.

VANITROPE.—704,925. Aromatic substances (other than essential oils) for flavouring foodstuffs. **Shulton, Inc.** (a Corporation organised under the laws of the State of New Jersey, United States of America), No. 697, Route 6, Clifton, County of Passaic, State of New Jersey, United States of America; Manufacturers.

NUTRILITE.—706,079. Preparations of minerals and vitamins for use as nutritive adjuncts to foodstuffs. **Nutrilite Products, Inc.** (a Corporation organised under the laws of the State of California, United States of America), 5600, Grand Avenue, Buena Park, State of California, United States of America; Manufacturers.

LITTLE CHIP.—706,363. Marmalade. **James Keiller and Son, Limited,** 9, Albert Square, Dundee, and 20, Soho Square, London, W.1; Manufacturers and Merchants.

SELANDIA.—707,587. Canned vegetables and canned fruits. **Mary Elisabeth Stoltz** (née **Stau**) trading as **Conservesfabriken Danica Ved C. Stau and Co.,** Kronprinsessegade 14, Copenhagen, Denmark; Manufacturer and Merchant.

TREX.—707,804. Margarine. **J. Bibby and Sons, Limited,** 21, King Edward Street, Liverpool, 3; Manufacturers.

TUDOR MAID.—708,616. Flour confectionery. **G. H. Rodway (Confectioners), Limited,** 33a, Waterworks Street, Aston, Birmingham, 6; Confectioners.

SABROE SOFT-ICE.—709,721. Ice making machines and parts thereof and fittings therefor. **Aktieselskabet Thomas Ths. Sabroe and Co.** (a Company incorporated under the laws of Denmark), Sonderalle 41, Aarhus, Denmark; Manufacturers.

CHUCKLES.—709,980. Non-medicated boiled sugar confectionery. **Robertson and Woodcock, Limited,** Trebor Works, Katherine Road, London, E.7; Manufacturing Sugar Confectioners.

FLOWLIFT.—710,065. Hand-propelled trolleys for transporting goods. **Fisher and Ludlow, Limited,** Albion Works, Kingsbury Road, Birmingham, 24; Manufacturers.

SYLVAN PRIDE.—710,504. Honey. **Arthur Joseph Spencer,** 49, Marlcliffe Road, Sheffield, 6; Merchant.

BANDOX.—710,827. Transport and packing boxes, all made of wood. **Eskilstuna Jernmanufaktur Aktiebolag** (a Company incorporated under the laws of Sweden), Kungsgatan 24, Eskilstuna, Sweden; Manufacturers.

OLTEX.—710,918. Edible oils, edible fats, and edible fat compounds. **Good Taste Foods (Manchester), Limited,** 9-17, Harriet Street, Walkden, Manchester; Merchants.

MARNET BAY.—711,043. Canned fish. **Duchy Canneries, Limited,** 90-96, Cannon Street, London, E.C.4; Merchants and Manufacturers.

PANTHA.—711,045. Parts and fittings of electrical instruments and apparatus for heating, lighting, cooking, refrigerating, drying, and ventilating. **Leonard Heys, Limited,** Faraday House, Henry Street, Blackpool, Lancashire; Merchants.

QUEEN OF HEARTS.—711,091. Baking powder and raising powder being an aerating preparation for use as an ingredient in food. **Joseph Lingford and Son, Limited,** 5, Durham Street, Bishop Auckland, County Durham; Manufacturers.

SNOWLIGHT.—711,190. Margarine. **The Craigmillar Creamery Company, Limited,** 28, North Bridge, Edinburgh, 1; Manufacturers.

TREBOR TWEETIES.—711,266. Non-medicated sugar confectionery, chocolate, and toffees. **Robertson and Woodcock, Limited,** Trebor Works, Katherine Road, London, E.7; Manufacturing Sugar Confectioners.

NESTAK.—711,563. Boxes and trays, all of common metal. **James Hustler and Son, Limited,** White Lund, Morecambe and Heysham, Lancashire; Manufacturers.

BORDERCOWBOY.—711,509. Canned meats. **Golden Harvest Pty., Limited** (a Company incorporated under the laws of Australia), Molang Road, Orange, New South Wales, Australia; Merchants.

New Companies

Top Hat (Bridlington), Limited. (512972.) 4, Avenue Road, Doncaster. To produce and market all classes of edible foods for human consumption; dealers in essences and flavours of all kinds; merchants of and dealers in potatoes, vegetables, and fruits; café proprietors, etc. Nom. cap.: £100 in £1 shares. Dirs.: J. J. Dangerfield and Mrs. C. Dangerfield, 4, Avenue Road, Doncaster.

Syplex Casings, Limited. (513113.) 26/7, Conduit Street, London, W.1. To carry on business of manufacturers of and dealers in edible casings for sausages and other food products, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: Lord Quibell, Manston, Cliff Gardens, Scunthorpe; W. J. S. Peschardt, 40, West End Avenue, Pinner, Middlesex; A. Spicer, Warren House, Iver Heath, Bucks.

W. Channing and Sons (Plymouth), Limited. (513117.) To carry on business of bakers, pastrycooks, biscuit makers, confectioners, tobacconists, grocers, etc. Nom. cap.: £3,000 in £1 shares. Dirs.: Mrs. L. G. Channing, 3, Wellesley Villas, Milehouse, Plymouth; R. E. Channing, 2, Keyham Cottage, Keyham Road, Plymouth; D. A. Channing, 3, Wellesley Villas, Milehouse, Plymouth.

Chocolate Box (Sydenham), Limited. (513215.) 149, Sydenham Road, Sydenham, London, S.E.26. To carry on business of manufacturers of and dealers in chocolate, boiled and other sweets, and confectioneries, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: F. C. Swann, 124, Parkland Grove, Ashford, Middlesex; Elsie M. Loughlin and R. E. Loughlin, 149, Sydenham Road, London, S.E.26.

Sorbay Ice, Limited. (515056.) 318, Uxbridge Road, Acton, London, W.3. To carry on business of manufacturers of and dealers in milk, ice cream, sundaes, etc. Nom. cap.: £1,700 in £1 shares. Dirs.: J. K. Landless, 210, Carlton Avenue West, Wembley; K. G. Rounsivell, 47, Byron Avenue, Kingsbury, London, N.W.9; D. Knight-Sims, 159, Watchfield Court, Chiswick, London, W.4.

Cola Extract Sales, Limited. (515032.) To carry on business of importers, exporters, merchants, and distributors of and dealers in cola seed and cola extracts and products of all kinds; manufacturers, bottlers, packers, and merchants of mineral and aerated waters, etc. Nom. cap.: £5,000 in 4,000 cum. pref. shares of £1 and 20,000 ord. shares of 1s. each. Dirs.: to be appointed by subs. Subs.: P. O. Ansell, 54, High View Gardens, Potters Bar (commercial manager), A. Matthews, 116, Chancery Lane, London, W.C.2 (commercial manager).

Middlehurst, Limited. (515075.) 140/42, High Street, Maidenhead, Berks. To carry on business of manufacturers of and dealers in adhesive products, packing materials, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: D. H. Dobbs, 27, College Avenue, Maidenhead; W. Breeze, 13, Keble Road, Maidenhead.

R. T. Kennedy, Limited. (515110.) 148, Temple Chambers, Temple Avenue, London, E.C.4. To carry on business of manufacturers, confectioners, pastrycooks, bakers, etc. Nom. cap.: £100 in £1 shares. Dirs.: R. C. Kennedy, 2, Clovelly Avenue, Colindale, London, N.W.9; D. C. Kennedy, 16, Nether Street, London, N.12; Dorothy Kennedy, 12, Hilton Avenue, London, N.12.

Shorey Hodgkinson and Cover, Limited. (515133.) 4/5, Warwick Court, High Holborn, London, W.C.1. To carry on business of packers, canners, package makers, and printers for the packing of foodstuffs and other goods; to make paper, cardboard, wood, and other kinds of boxes, etc., corn and flour merchants, etc. Nom. cap.: £500 in £1 shares. Dirs.: J. J. Hodgkinson, 3, Brewery Road, London, N.7; R. H. Cover, 94, Aberdeen Park, London, N.5; R. M. Shorey, 70, Dorchester Way, Kenton, Middlesex.

Charles Howell (Newton), Limited. (515185.) Commercial House, Newton Road, Newton, Swansea. To carry on business of bakers, cake and biscuit makers, pastrycooks, confectioners, etc. Nom. cap.: £2,500 in £1 shares. Dirs.: Jane Howell (permt.) and G. J. Howell, Commercial House, Newton Road, Newton, Swansea; G. Howell, The Oaks, Murton Lane, Murton, Glam.; Mrs. A. Richards, and Mrs. H. J. Lewis.

Fowler Farkas (Foods), Limited. (515191.) To carry on business of exporters, importers, merchants, and manufacturers of and dealers in foodstuffs, general provision merchants, etc. Nom. cap.: £5,100 in 2,000 ordinary shares of 1s. and 5,000 red. cum. pref. shares of £1 each. Dirs.: not named. Subs.: C. S. Brown, 6, Suffolk Street, London, S.W.1 (solr.), and E. Sutch, 25, Lambert Road, London, S.W.2 (clk.).

A. Cartwright and Sons, Limited. (515222.) 36, Union Street, Wednesbury, Staffs. To carry on business of manufacturers of and dealers in confectionery, sweets, chocolates, ices, biscuits, and cooked and prepared food, etc. Nom. cap.: £5,000 in £1 shares. Dirs.: A. T. A. Cartwright, 14, Walsall Road, Wednesbury, and R. F. Cartwright, 12, Mounts Road, Wednesbury.

From Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.